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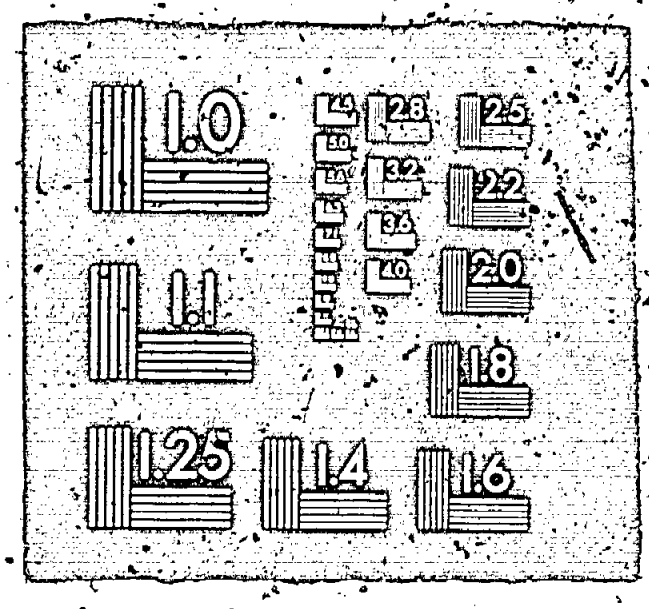

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# Safety Effectiveness Evaluation
# The Usefulness of Insurance Data in Highway Safety Research

(U.S.) National Transportation Safety Board
Washington, DC

25 Aug 81

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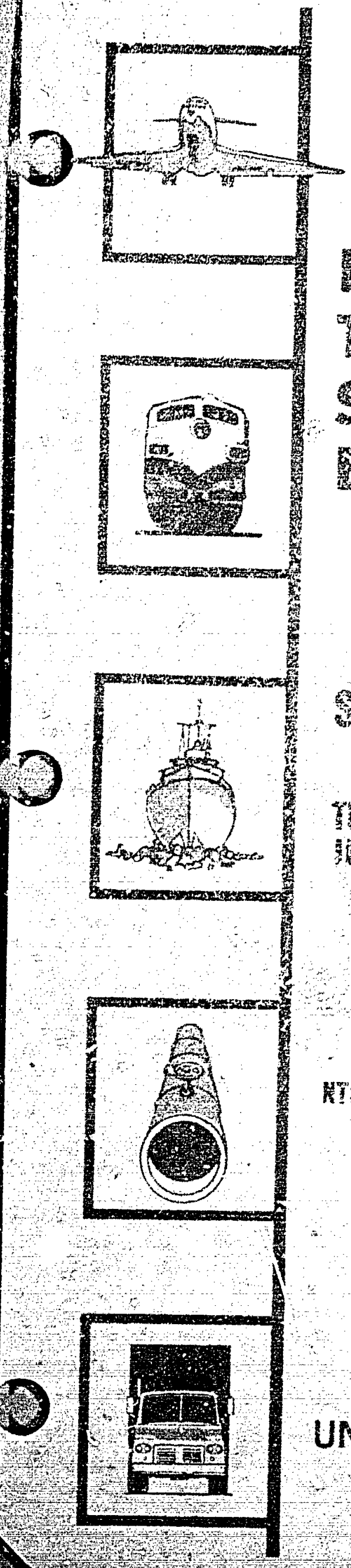

NATIONAL TRANSPORTATION SAFETY BOARD

# NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

## SAFETY EFFECTIVENESS EVALUATION

## THE USEFULNESS OF INSURANCE DATA IN HIGHWAY SAFETY RESEARCH

NTSB-SEE-81-5

UNITED STATES GOVERNMENT

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16. Abstract

The National Transportation Safety Board has evaluated the potential usefulness of insurance data in highway safety research. In the course of the study, the Safety Board reviewed methods used by the insurance industry to gather and process applications, claims, and other data that insurance companies use in their routine business. Additionally, the Safety Board reviewed past and current attempts by Federal agencies to use insurance data in highway safety research.

The Safety Board concludes that most of the data collected by insurance companies are inappropriate for use in highway safety research. However, some data are potentially useful. In its evaluation, the Board cites examples of Federal safety research that has made beneficial use of insurance data. The Board also cites research efforts that attempted to use insurance data in inappropriate ways.

The Board recommends that DOT and the insurance industry establishes a formal consultative arrangement, through AIRAC, an insurance industry research committee, to avoid future inappropriate use of insurance data.

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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

SAFETY EFFECTIVENESS EVALUATION

Adopted: August 25, 1981

# THE USEFULNESS OF INSURANCE DATA IN HIGHWAY SAFETY RESEARCH

## INTRODUCTION

The insurance business touches virtually every aspect of American highway transportation. More than 90 percent of all automobile owners buy insurance to protect themselves against financial loss that might result from a vehicle crash, fire, or other vehicle-related mishap. 1/ Virtually all commercial transportation is insured.

This pervasiveness of insurance in highway transportation has prompted speculation that insurance data are a fertile source of information on virtually every aspect of highway transportation. The speculation has led to numerous attempts to use insurance data as a highway safety research tool. In the highway safety research community and among policymakers, there is a perception that in the vast amounts of data collected by the insurance industry and insurance companies individually, there "must" be a substantial amount of information that would be helpful in identifying the causes or sources of highway losses, developing countermeasure programs to reduce those losses, and evaluating the effectiveness of programs once they are implemented.

The interest in insurance data as a highway safety research tool is not new. Almost 15 years ago researchers from the U.S. Public Health Service wrote:

> Recently, a number of voices have been heard decrying the untapped potential of the massive amounts of automobile accident data in insurance company files. The assumption is that if only the insurance companies would use (or allow others to use) these data in traffic safety research, the number of injuries and deaths on the nation's roads could be cut drastically. 2/

More recently, those perceptions are illustrated in attempts to implement the Motor Vehicle Information and Cost Savings Act of 1972 and the financial responsibility requirements set forth in section 30 of the Motor Carrier Act of 1980. In addition to these two major efforts to harness insurance data, there have been several others. The National Highway Traffic Safety Administration (NHTSA) has used or attempted to use insurance data to determine the effectiveness of manufacturer response to automobile bumper standards, to develop damageability and crashworthiness ratings of automobiles, to determine the incidence of crash-related automobile fires, and to determine the effectiveness of motorcycle helmet laws.

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1/ Insurance Facts, Insurance Information Institute, New York, New York, 1980-81 edition.

2/ The Feasibility of Using Automobile Insurance Company Data in Epidemiological Research of Injuries and Deaths from Motor Vehicle Accidents, D. M. Nitzberg and E. H. Kanter, U.S. Public Health Service, National Center for Urban and Industrial Health, Sept. 1, 1967.

Significantly, each of these efforts represents the perception that insurance data are easily capable of providing answers to a multitude of questions. The Safety Board has examined this perception, and has explored the extent to which and methods by which insurance companies collect and store their data; and, importantly, the willingness of the insurance industry to share those data with public agencies.

This report does not purport to be a comprehensive evaluation of the insurance business and its data-gathering, data-handling, and data-analysis practices. Those practices vary substantially from company to company and depend, in large measure, on the size and data-processing sophistication of the individual companies. Rather, the report focuses on the larger companies which are recognized in the industry to have data capabilities that far exceed those of companies with relatively fewer resources. It explores the data-gathering practices, examines the purposes for gathering those data, and reveals the inherent limitation of some of those data for purposes other than the business of insurance.

## THE AUTOMOBILE INSURANCE BUSINESS

After several Federal Courts ruled that the insurance industry is a part of interstate commerce and, therefore, subject to Federal regulation, the Congress passed the McCarran-Ferguson Act of 1945. The Act, in effect, determined that the various States, not the Federal government, would regulate the insurance business. With minor modifications, the 1945 McCarran-Ferguson Act remains in effect today.

Although automobile insurance is one of the largest financial businesses in the country, it is characterized by its disaggregation. There are more than 1,000 companies that write automobile insurance in the United States. 3/ In 1979, State Farm, the largest automobile insurance company, had only 14 percent of the total automobile market and 17.1 percent of the private passenger automobile market. The second largest company, Allstate, had only 8.6 percent of the total market and 10.4 percent of the private automobile market. Although no single company dominates the market, and many companies have minute shares of the market, more than half (51.3 percent) of the automobile insurance in America is written by 15 companies. 4/ (See table 1.)

It is important to keep in mind that insurance companies are financial institutions. Their primary concern is that the premiums they collect are greater than the casualty losses they incur. The significance of this point is that, in large measure, it dictates the data that are of primary concern to insurers. This is not to say that insurers do not collect more than the barest financial information. Insurance companies collect substantial amounts of information. The primary sources of that information are policy applications and claims that arise from crashes which involve vehicles that they insure. Although some insurers, notably the large companies, gather, process, and analyze more data than others, as a general rule, data that are automated consist of premiums collected, claims paid, some indication of exposure (i.e., the number of vehicles insured), and the category in which the loss occurred (i.e., collision, liability, property damage, etc.). These data are collected to establish loss profiles and for the purpose of establishing rates.

3/ The term automobile insurance is used in this report to refer to both private and commercial automobile insurance. Private automobile insurance is purchased by individuals for their privately owned vehicles. Commercial automobile insurance is purchased for commercial vehicles, ranging from taxi cab fleets to commercial truck fleets.

4/ Best's Insurance Management Reports, July 21, 1980.

Table 1.—Leading Automobile Insurers, 1979.

| | Direct premiums (in thousands) | Percentage of market share |
|---|---|---|
| State Farm | $5,140,601 | 14.0 |
| Allstate | 3,149,574 | 8.6 |
| Farmers Group | 1,758,733 | 4.8 |
| Aetna L&C | 1,259,145 | 3.4 |
| Nationwide | 1,188,311 | 3.2 |
| Liberty Mutual | 813,288 | 2.2 |
| Travelers | 801,247 | 2.2 |
| Continental | 701,005 | 1.9 |
| Hartford Group | 694,317 | 1.9 |
| U.S.F.&G | 626,952 | 1.7 |
| Fireman's Fund | 570,038 | 1.6 |
| Govt. Employees | 556,726 | 1.5 |
| INA Corp. | 540,399 | 1.5 |
| U.S.A.A. | 530,431 | 1.4 |
| Sentry Group | 528,837 | 1.4 |

(Source: Best Insurers Management Reports, Release No. 16, July 21, 1980, A.M. Best Co., Oldwick, N.J.)

**Policy Application Data**

The policy application is the basis on which an insurance company decides whether to insure a risk. (See appendix A for example of a typical form.) Although it may vary from company to company, most of the information that is requested is the same. 5/ Insurance forms also may differ from State to State, depending upon particular insurance regulation. The data collected are used by the company to decide whether the risk is acceptable by its standards and at what premium rate that risk becomes acceptable. In addition to name and address of the applicant, they request the identity of the applicant's employer and the amount of time with that employer; whether, in the last 3 years, "the applicant, any household member or any regular driver" has had their license to drive or registration suspended, revoked or refused, been a driver in an accident or loss, been convicted (or forfeited bail) for traffic violations; "fined or imprisoned or been on probation or parole for any nonmotor vehicle offense," or "have any physical limitations or mental defects." The applications also request the driver's license number and State of issuance, driver's age, length of time licensed, occupation, sex, and marital status.

In addition to the driver-related data, the following vehicle-related data are requested for the vehicle that is being insured: the year, make and model, body type, cylinders, vehicle identification number, and when purchased. Other information is requested for motorcycles, motor homes, customized vehicles, high-performance vehicles, and mounted campers. Vehicle use (i.e., driven to work or school, business use, and annual mileage), whether two or more vehicles are being insured, and whether the drivers have had driver training or qualify for a "good student" discount all are considered. State Farm and other insurers generally automate and evaluate most of these data to determine the relative risk associated with each category.

5/ State Farm differs from other insurance companies in that it requires separate application for each vehicle that it insures. Most insurers group vehicles by family. The practice of separating, recording, and tracking vehicle-related experience increases State Farm's ability to isolate vehicle-related factors.

This information is considered privileged between company and client on an individual level, and on the corporate level, in the aggregate, is guarded as proprietary. However, some insurance companies do participate in research organizations that use some of these data in aggregate form. In fact, the data are essential in insurance industry research because they provide the basis for determining exposure. A knowledge of exposure is fundamental in establishing the significance of the frequency of whatever occurrence is being studied.

**Claims Data**

By far the largest volume of data collected by insurance companies are those which accompany claims. These data are collected to determine whether the claim is valid and how much the insurance company must pay. The amount of information in a claim file varies and is determined by the severity and complexity of a crash.

**Data Collection**

Methods used to gather information on a crash or other incident that results in an insurance claim vary from company to company. Larger companies employ their own claim adjusters; other companies may hire independent claim adjusters or damage appraisers. No private automobile insurance company is known to employ trained accident investigators. In fact, even insurers of commercial fleets seldom, if ever, examine the actual crash site. Most data are gathered from individuals who were involved in the incident. In cases that involve more than minor property damage, police reports may be included.

Data collected on claims are generally limited to what an insurance company considers necessary to settle or "close" that claim. Although the judgment of how much data are sufficient may vary from insurance company to insurance company and even among claim adjusters within a single company, the Automobile Claim Report used by State Farm is considered representative (see appendix B). Such forms may be personally completed by individual claimants or may be completed by claim adjusters, with details given in person or telephonically by involved parties. The claim adjuster generally does not see the vehicle unless the company uses "drive-in" claim facilities.

Typical of the information that is included in a claim report are: "distance (in feet) from other cars when danger first noted," "speed when danger first noted," and "speed at impact." Generally, a brief narrative is used to describe the crash. Information about the highway is restricted to one data block labeled "road condition," which is generally interpreted to mean whether the road was wet or dry.

**Other Data**

It is difficult to know the extent to which individual insurance companies privately conduct research, the results of which are closely held. However, insurance companies are known to vigorously compete for information. That information can be, and presumably is, used to refine an insurance company's "book of business," discouraging business that might be associated with greater losses and attracting business that might experience fewer or less severe losses. Several insurance industry executives thought it doubtful that an insurance company, after developing such information with its own resources to improve its own competitive position, would be willing to share such information. Even to acknowledge that such information exists would tend to compromise any competitive edge that the information might provide the company that originated it.

## INSURANCE INDUSTRY RESEARCH

Apart from the research that individual insurance companies conduct, the industry sponsors several research organizations that deal with highway transportation losses. The Insurance Institute for Highway Safety and its affiliated Highway Loss Data Institute deal exclusively with highway losses. The All-Industry Research Advisory Council is concerned with a broad range of insurance-related issues.

The Insurance Institute for Highway Safety (IIHS) is a Washington, D.C.-based organization funded by the industry. It employs a multidisciplinary staff of researchers and funds additional research by independent researchers. The IIHS has been a significant force in channeling concern about highway losses in a scientific direction. The organization routinely submits its research findings to the NHTSA and other government organizations that are concerned with highway losses. IIHS researchers frequently publish their papers in medical, public health, and other scientific journals. These studies and others are publicly available.

Although the IIHS is the insurance industry's primary research mechanism for studying highway losses, the organization seldom in its research uses data from insurance companies. The IIHS vice president for research explained that, "despite the widespread belief to the contrary, insurance claim files do not contain much information that is suitable for either research or policymaking." 6/ He said that the IIHS tends to feel that much of the information contained in claim files is unreliable. Because the information is "self-reported by the motorist involved and because so much emphasis has been placed on establishing fault," claim files often contain "major discrepancies in the 'facts' as reported to the insurers." The IIHS feels that even if the data were reliable "there is no practical method to access the detailed information contained in insurance claim files." 7/

The Highway Loss Data Institute (HLDI), affiliated with the Insurance Institute for Highway Safety, specializes in analyses of automated insurance company claims data. Those data are supplied by participating insurance companies which, according to the HLDI, "insure about half of the private passenger vehicles in the United States." Those companies routinely submit computerized data in a prescribed format. The data are analyzed to determine the amount and frequency of dollar losses associated with human or property damage that occur by make, model, body style, and other vehicle characteristics.

According to the organization's senior vice president, the data that the HLDI receives consist of:

> minimum, but objective and reliable, data from a large number of vehicles. We believe that this is the way insurance data can most usefully contribute to this (safety research) field; they can provide basic information on large numbers of vehicles and as an early warning concerning specific vehicle types that may have losses that are out of line. The only information that can be obtained reliably and on a large scale consists of approximate crash dates and the sizes of the resulting claims, and whether or not they are for damage to the vehicles or injuries to the occupants. It is not possible, for example, in the injury claim areas to get measures of injury severity or even adequate information on deaths. . . . [This is the] only information that can be accessed without major disruption of insurance day-to-day operations. 8/

6/ Letter from the Vice President for Research, IIHS, and Senior Vice President, HLDI, to NTSB, July 24, 1978.
7/ Ibid.
8/ Ibid.

(See appendix C for a recently published description of the HLDI data system.)

The All-Industry Research Advisory Council (AIRAC) is essentially an organization formed by and consisting of research personnel from the three major insurance trade associations and a number of insurance companies. The council's activities are coordinated by a full-time executive director. The work of the AIRAC—from collecting and analyzing data to publication of its reports—is handled on an ad hoc basis by member companies and associations, which contribute data and the time of their executives and other employees.

Although the organization is concerned with the full spectrum of issues that face the insurance industry, it has conducted several studies related to automobile insurance and highway losses. One AIRAC study, Automobile Injuries and their Compensation in the United States, drew on automobile accident claim data from 29 insurance companies. The research vice president of the Alliance of American Insurers estimated that the cost of processing, evaluating, and compiling the data from the 60,000 claims used for the report would have exceeded $1 million if those services had not been contributed. 9/ The report is said to derive from insurance claim files all that is economically feasible. This and other AIRAC reports are available to the public.

## GENERAL MOTORS DATA-GATHERING SYSTEM

Motors Insurance Corporation (MIC), a wholly-owned subsidiary of General Motors Corporation (GM), collects more detailed information on claims than any other insurance company. The data it collects are turned over to GM. Since MIC markets its insurance through GM dealerships, virtually all of the vehicles it insures are manufactured by GM. The claims data it gathers are restricted to first-party coverage for GM vehicles. MIC does not sell liability insurance.

GM began collecting data through its insurance company subsidiary in 1967. According to a GM official, the program was initiated to collect "real world" data on the performance of energy-absorbing steering columns, which in the face of a Federal mandate, the company had started installing in its cars. For a period of time, MIC claim adjusters removed and sent to GM the steering columns of GM vehicles that had been involved in a crash. Although MIC's claim adjusters no longer routinely send pieces of hardware to GM, they do compile substantially more information on a claim than do their counterparts in other insurance companies. At one time MIC was collecting detailed data on claims filed for all GM vehicles that were involved in injury-producing or tow-away crashes.

However, in what is said to be an economy move, GM has discontinued MIC's collection of detailed information on all claims, concentrating instead on current model-year vehicles with special emphasis on selected new vehicle lines or vehicles that include "new" technology. A two-page, "620 Survey Report" (see appendix D) is completed for every claim filed for the vehicles that GM has selected for study. Portions of the report vary from time to time, requesting data on vehicle features that are of special interest at a particular time. The sample forms provided to the Safety Board by GM reflected an interest in fuel tank damage. GM's more extensive 15-page, "Collision Performance and Injury Report" (see appendix E) is filed if claims for the selected vehicles involve personal injuries or if the vehicle must be towed. This report is accompanied by a roll of film containing photographs of the damaged GM vehicle. GM automates the data that it receives from the MIC. A GM official estimates that MIC's

9/ Vice President, Research, Alliance of American Insurers, telephone interview, May 22, 1980.

adjusters spend as much as 3 hours collecting the information and completing the forms. Another 2 hours are required for GM technicians to automate the data on each report. GM pays MIC $67 for each 15-page report and $1 for each 2-page report. 10/

The data collected by MIC are used by GM to assess vehicle design. Additionally, the data are used by GM to support its position on Federal rulemaking activities. Otherwise, the data are generally considered proprietary and are not available to Federal agencies for research or other purposes. According to GM officials, MIC does not need or use the detailed data in its routine insurance business.

## NHTSA USE OF INSURANCE DATA

The most significant attempt to use insurance claim data for purposes other than to settle insurance claims was prompted by requirements of the Motor Vehicle Information and Cost Savings Act of 1972. Title II of that Act required the Secretary of Transportation to compile and furnish the public with information on the "damage susceptibility," "degree of crashworthiness," and vehicle characteristics associated with "the ease of diagnosis and repair of mechanical and electrical systems." 11/ Insurance companies were considered primary sources of data and were required by the statute to furnish the Department of Transportation (DOT) with data to satisfy the requirements for information on damage susceptibility and crashworthiness.

However, efforts to use insurance data to establish ratings for automobile damageability and crashworthiness were hampered because the information in claim files was not uniform, even within a single company. In its early attempts to implement Title II of the Motor Vehicle Information and Cost Savings Act of 1972, the NHTSA obtained a sample of 233 closed claim files from seven major insurance companies. Data on 52 items were coded. More than half of the files lacked information considered "critical" by the NHTSA. In claims from "first party" cars (the cars insured by the reporting insurance company), use of occupant restraints could be determined in only 3.4 percent and medical costs were found in only 48.1 percent of the files. Information in the claim files on "third party" cars (vehicles other than those insured by the reporting insurance company), were found to be complete in even fewer cases. For example, only 15.2 percent of those claims even had the car's vehicle identification number (VIN). Although the number of people in the car was recorded 72.8 percent of the time, their seating position was indicated only in 57.1 percent of the files. Some types of information were included in virtually all of the files of each company. Information on first-party cars was more complete than that on third party. For instance, the estimated cost to repair the damaged vehicle was known in 96.9 percent of the first-party claim files and 64.7 percent of the third party claims. NHTSA's analysis of the claim files indicates that the speed of the crash was known 30.1 percent of the time in first-party files and 40.2 percent of the time in third-party files. There is no indication of how these crash speeds were determined. The analysis indicates that coding each claim file required between 11 and 24 minutes, with the average being almost 16 minutes.

As a check on NHTSA's coding procedures, the participating insurers coded the data from the same claim files. They found that their coders often differed with NHTSA's coders in interpreting data in the claim files. "A simple analysis of the reliability of this

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10/ The GM official responsible for this aspect of the company's research program acknowledges that this amount does not adequately compensate the MIC for the time required to complete the 2-page report.

11/ The terms "damage susceptibility" and "damageability" are used interchangeably. Both refer to the susceptibility of vehicles to damage as a result of motor vehicle accidents. Crashworthiness refers to the degree of occupant protection provided by vehicles in any motor vehicle accident."

coded information clearly indicated that the separate coders frequently reached different conclusions concerning items, thus raising yet another question about the validity of such data." 12/ Beyond the concern about imprecise coding, the insurers pointed out that the basic validity of the data remained questionable. For example, it is difficult, if not impossible, to accurately determine the speeds of vehicles involved in a crash.

In response to Title II requirements of the Motor Vehicle Information and Cost Savings Act of 1972, the insurance industry formed an ad hoc committee to "work with the Department of Transportation in developing methods, systems, and the underlying data needed to implement" the legislation. As part of that effort, the committee developed a table (see table 2) that details the availability of insurance company accident data. Importantly, this table offers qualitative evaluations on the accuracy of the data. Although some insurers have increased the amount of data that they automate, industry researchers indicate that little has changed in industry practices to affect the condition of these data since 1975.

Insurance industry research executives who were interviewed during this evaluation repeatedly emphasized the importance of understanding, and using, a measure of frequency when insurance data are interpreted. That point was emphasized in an industry position paper on implementation of Title II, which insisted that "any ranking system that uses real world data and does not utilize frequency information in some manner will be grossly inadequate, and in many circumstances will produce incorrect answers." The position paper explained:

> For example, if vehicle design changes could eliminate much of the damage resulting from low speed crashes, this would increase the proportion (without increasing the number) of crashes with high repair costs. Thus, the average damage per claim would increase despite the fact that real improvements had occurred. Conversely, if vehicle design changes could increase the frequency of damage in low speed crashes, this would decrease the proportion (without decreasing the number) of crashes with high repair costs. Thus, in this instance, the average damage per claim would decrease despite an inferior design. Only by including a frequency component can erroneous conclusions be avoided. 13/

During NHTSA's attempts, in the early 1970's, to implement the vehicle rating schemes called for by the Motor Vehicle Information and Cost Savings Act of 1972, the insurance industry, NHTSA, and NHTSA contractors spent considerable time evaluating insurance company claim files. 14/ The industry, through its ad hoc committee, insisted that claim files were "an inappropriate and inefficient source of reliable data." A major deficiency is its inability to provide any indication of frequency or exposure. The industry urged that the agency and its contractors use data that were being published by HLDI. The committee said:

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12/ Letter from M. Stanley Hughey, Executive Vice President, Kemper Insurance Companies, to Edward J. Lievens, Jr., Acting Chief, NHTSA Auto Ratings Division, January 7, 1975.

13/ Attachment to letter from M. Stanley Hughey, Executive Vice President, Kemper Insurance Companies, to Senator Warren G. Magnuson, March 11, 1975.

14/ Ibid.

## Table 2.—Source and evaluation of insurance company accident data.

| Data Items | Available on Magnetic Tape | | Data Available in Claim and Policy Files | |
|---|---|---|---|---|
| | Insured Car | 3rd Party Claimant Car | Insured Car | 3rd Party Claimant Car |
| Accident Description<br>Collision Type (general descriptions such as "Hit fixed object" or "Rear-ended" or "Head on") | None | None | Good data usually available. | Good data usually available. |
| Road Type | None | None | Sometimes available. | Sometimes available. |
| Severity Indicator[1] | Available from some cos. in rough categories. | Available from some cos. in rough categories. | May be available, but usually unreliable. | May be available, but usually unreliable. |
| Vehicle Occupancy | None | None | Almost never available if no injury in insured car. Sometimes available for injury cases. | Almost never available if no injury in claimant car. Sometimes available for injury cases. |
| Type Claim (Coverage for which claim made) | Always available if claim made. | Always available if claim made. | Always available if claim made. | Always available if claim made. |
| Vehicle Description<br>Make | Good data available from some insurance companies. | None | Good data almost always available. | Sometimes available. |
| Model | None | None | Good data almost always available. | Sometimes available. |
| Body Style | None | None | Usually available. | Seldom available. |
| Year | Good data available from some insurance companies.* | None | Good data almost always available. | Sometimes available. |
| VIN | Good data available from a few insurance companies. | None | Good data usually available. | Sometimes available. |

[1]This is interpreted to mean some categorization of deformation of sheet metal and vehicle structure, or possibly an indication of speed at impact. It should be recognized that the amount paid for the claim is also an indicator of accident severity.

*Data available on magnetic tape from the two major statistical reporting organizations, NAII and ISO.

Table 2.—Source and evaluation of insurance company accident data (cont'd).

| Data Items | Available on Magnetic Tape | | Data Available in Claim and Policy Files | |
|---|---|---|---|---|
| | Insured Car | 3rd Party Claimant Car | Insured Car | 3rd Party Claimant Car |
| Vehicle Damage and Costs<br>Point of Principal Impact | None | None | Can sometimes be determined if claim made. | Can sometimes be determined if claim made. |
| Components<br>Labor Hours<br>Labor Cost<br>Net Parts Cost<br>Paint & Mat Items<br>Total Repair Cost | None | None | Good data usually available from a few of the large insurance companies who use their own adjusters and repair estimators. Data may not be available from smaller companies and those who rely on agents or independent adjusting firms. (Categories are not necessarily consistent either within or among companies.) | Good data often available from a few of the large companies who use their own adjusters and repair estimators. Data may not be available from smaller companies and those who rely on agents or independent adjusting firms. (Categories are not necessarily consistent either within or among companies.) |
| Amount Paid | Always available. Not necessarily equal to repair cost.* | Always available. Not necessarily equal to repair cost.* | Always available. Not necessarily equal to repair cost. | Always available. Not necessarily equal to repair cost. |
| Injuries and Costs<br>Age-Sex | None | None | Age and sex of injured persons are usually available. If there are injuries but no claim is made, then no information is available. | Age and sex of injured persons are usually available. If there are injuries but no claim is made, then no information is available. |
| Seating and Restraint Use | None | None | Seating sometimes available. Restraint use almost never available. | Seating sometimes available. Restraint use almost never available. |
| Injury Type-Severity | None | None | Some information often available if claim is made. | Some information often available if claim is made. |
| Court Awards<br>Medical<br>Wage Loss<br>Pain & Suffering | None | None | Accurate data usually available. It may be necessary to estimate the split among categories. | Accurate data usually available. It may be necessary to estimate the split among categories. |

*Data available on magnetic tape from the two major statistical reporting organizations, NAII and ISO.

## Table 2.—Source and evaluation of insurance company accident data (cont'd).

| Data Items | Available on Magnetic Tape | | Data Available in Claim and Policy Files | |
|---|---|---|---|---|
| | Insured Car | 3rd Party Claimant Car | Insured Car | 3rd Party Claimant Car |
| **Injuries and Costs (cont'd)** | | | | |
| Settlement Cost<br>Medical<br>Wage Loss<br>Pain & Suffering<br>Death<br>Loss of Service<br>Other Economic Loss | Good data available from most companies for No-Fault states. Some companies may use only the categories Medical, Wage Loss, and Other Economic Loss. Other companies can provide all categories. No information available for non-No-Fault states. | | Accurate data usually available. It may be necessary to estimate the split among categories. | Accurate data usually available. It may be necessary to estimate the split among categories. |
| Total Settlement Cost | Good data available. Some companies have data on a per accident basis rather than per person basis.* | Good data available. Some companies have data on a per accident basis rather than per person basis.* | Accurate data available. | Accurate data available. |
| **Exposure** | | | | |
| Make | Available from a few companies. | None | Good data available. | None |
| Model | None | None | Good data available. | None |
| Body Style | None | None | Usually available. | None |
| Year | Good data available from a few of the large companies.* | None | Good data available. | None |
| VIN | Good data available from a few of the large companies. | None | Usually available. | None |
| Type Coverage | Always available.* | None | Always available. | None |
| Area Designation | Always available.[1]* | None | Always available. | None |
| Driver Classification[2] | Always available.* Inconsistence between companies. | None | Always available. | None |
| Mileage[3] | Available, but of poor quality with inconsistency between companies. | None | Available, but of poor quality with inconsistency between companies. | None |

[1] Garaging location always available. Accident location not available except in claim file.

[2] Rough categorization of the principal car driver(s); not necessarily the driver involved in the accident.

[3] Rough categories of estimated mileage driven per year. Mileage at time of accident not available.

* Data available on magnetic tape from the two major statistical reporting organizations, NAII and IRO.

> These data . . . show a number of consistent trends from model year to model year and from model to model, trends that we believe could form a significant piece of any predictive ranking system developed for Title II. It is our firm belief that insurance data of this type are ideally suited to answer some of the questions concerning which particular vehicles are having abnormal loss experience. The computer generated data are, by their very nature, poorly suited to answer the second level question which is why particular makes and models are having such experience. 15/

In December 1980, the director of NHTSA's Office of Automotive Ratings asked rhetorically whether "since the HLDI collects historical damageability statistics, and the insurance industry is developing a rate structure reflecting damageability differences, is there a need for the Federal government to do more, other than perhaps to print and disseminate the HLDI data and premium differences?" 16/

Just as insurance companies were considered a primary source of information on the damageability of automobiles, they were also considered a potentially valuable source of information on the crashworthiness of automobiles. However, the NHTSA has concluded "that specific make and model crashworthiness comparisons isolating the effects of the vehicle are not yet feasible from historic files, and may never be from police reports or insurance files." 17/

According to the director of NHTSA's Office of Automotive Ratings,

> Insurance claims files frequently have insufficient information in them which would permit one to isolate the effects of the vehicle itself on injuries to occupants. Claims data lack accurate injury severity measures, a key variable to be measured in any historical data system. In addition, the inferences one can make about injuries from claims paid are limited. Without accurate measures of accident and injury severity, the insurance claims files present little usable information for rating automobiles. This is no criticism of insurance claims data, since they are not collected for the purpose of isolating the crashworthiness of cars. 18/

Insurance claims data, as is the case with other historical data, do not permit effects of the design of the vehicle to be isolated from the effects of other factors, such as the vehicle driver or occupants (i.e., age, physical condition, seating position) or the circumstances of the crash (i.e., whether the crash involved a Pinto and a Vega or a Pinto and a Mack truck).

In addition to the substantial effort involved in attempts to implement Title II of the Motor Vehicle Information and Cost Savings Act of 1972, NHTSA has used or attempted to use insurance data in several other activities. During its attempt to determine the extent

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15/ Ibid.

16/ In fact, this is exactly what NHTSA did when it published its Car Book in 1980. Rather than use insurance claim data to establish a damageability and crashworthiness rating system for automobiles, the NHTSA used insurance claims data which has been compiled and published by the HLDI since the early 1970's.

17/ Michael B. Brownlee, Director, Office of Automotive Ratings, NHTSA, Remarks prepared for the International Automotive Ratings Symposium, December 9, 1980.

18/ Ibid.

to which the agency uses or has used insurance data, the Safety Board requested that the NHTSA supply a list of projects that had made use of or had attempted to use insurance data. In addition to Title II, the list included evaluation of the effectiveness of NHTSA's bumper standard; assessment of the costs and benefits of occupant restraint systems; a congressionally directed study of truck accidents; child restraint use; and evaluation of the effect of repealing motorcycle helmet use laws.

During subsequent interviews with NHTSA officials, the Safety Board learned that NHTSA had, in fact, made other attempts to use insurance data. For example, in 1979, the agency enlisted the cooperation of four insurance companies to determine the extent of automobile fires. Although no report has been written, some documentation of that project was possible. In another instance, NHTSA explored the possibility of using claims data from truck insurers to determine whether crashes were occurring that could be attributed to its antilock brake standard (Federal Motor Vehicle Safety Standard 121). The NHTSA staff member who conducted that inquiry said during a Safety Board interview that the search for insurance data to establish a link between the antilock requirements and an increase in accidents proved fruitless. No documentation of the inquiry was available.

Although it does not appear possible to obtain documentation of the full extent of NHTSA's attempts to use insurance data, discussion of the instances that are known can provide some insight into the limitations and capabilities of insurance data.

**Bumper Effectiveness**

While NHTSA did not use insurance data to the extent it had once planned in implementing Title II of the Motor Vehicle Information and Cost Savings Act of 1972, it made substantial use of insurance claim data in evaluating the effectiveness of auto manufacturer response to the "no-damage" bumper standard that was required by Title I of the same act. 19/

In March 1976, NHTSA issued a standard to limit bumper and other vehicle surface damage in low-speed collisions. 20/ The standard applies to passenger vehicles manufactured on or after September 1, 1978 (49 CFR Part 581, Bumper Standard). The standard requires that those cars resist front and rear-end damage in 5-mph barrier and pendulum crash tests and in a 3-mph corner-impact pendulum test.

To evaluate the standard, NHTSA depended heavily on insurance claims data from State Farm, the largest automobile insurance company in the United States and recognized as having the most extensive automated data system in the industry. The agency did so after considering and rejecting police accident reports; State accident records; national accident records; repair shop, garage, and body shop records; auto parts sales and inventory records; towaway business records; and inspections of automobiles in

19/ Analysis of Insurance Claims to Determine Bumper Effect on Crash Damage--1979 Model Year, DOT HS805866, October 1980.

20/ This standard was preceded by FMVSS 215, which was issued April 9, 1971, under the National Traffic and Motor Vehicle Safety Act of 1966. FMVSS 215 was applicable to 1973 model passenger cars and prohibited damage to specified "safety related items" in prescribed barrier tests. Beginning with the 1979 model year, "safety related" requirements of FMVSS 215 were combined with the prohibitions of cosmetic damage specified in Part 581.

parking lots. 21/ The agency supplemented the insurance claims data with surveys of automobile owners and drivers.

The NHTSA report on this project explained that automated insurance claims data are well-suited for the property damage analyses that were necessary to determine whether the bumper standard had made a beneficial impact. Insurance data can be used "as an indirect measure of 'real world' low-speed, low-damage reported accidents. It is hypothesized that changes in insurance claim characteristics can reflect changes in vehicular damage in low-speed accidents and that these changes are attributable to the implementation of the bumper standards." 22/

The data classification available from State Farm that were used in the analysis spanned more than 7 years (pre-1973 models, which were not required to meet any bumper standard, through 1978.) Automobiles included in the sample were either 1 or 3 years old when they crashed. Four impact points were included (front, front corner, rear, and rear corner). Analyses were possible by market class; whether the bumper was repaired or replaced; whether the struck object was fixed or moving; the type of insurance coverage under which the claim was made, i.e. collision or liability; the vehicle manufacturer; whether the bumper was made of steel, aluminum, or other substance; and whether any of six parts were damaged (front head lamp, tail lamp, hood, trunk, front quarter panel, or rear quarter panel).

**Motorcycle Helmet Law Repeal**

On July 1, 1976, Kansas repealed its mandatory motorcycle helmet law. NHTSA contracted with the University of Kansas, College of Health Sciences to evaluate the effects of the helmet law repeal. The contract work statement developed by NHTSA, stipulated, among other things, that the researchers were to obtain data from insurance companies on the financial losses associated with motorcycle crashes. The NHTSA contract technical officer responsible for the research project acknowledged during a telephone interview that he had not talked with insurance company researchers before developing the work statement to determine whether such data existed or were available.

Kansas requires that vehicle registration be accompanied by certification of insurance. According to one of the researchers on the project, the research team assumed that the mandatory insurance requirement would guarantee that insurance companies have information on injuries that resulted from motorcycle crashes.

According to the contractor's report, "Through accident report forms, and proof of insurance forms which were on file with the Kansas Department of Revenue, 309 insurance policy numbers were identified for owners of motorcycles involved in accidents during 1977 and 1978, as well as owners of other motor vehicles involved in motorcycle accidents, where a liability situation might exist."23/

The researchers devised a form which requested that insurance companies provide cost information on property damage, rehabilitation, hospitalization, doctor expense, drugs, x-rays, and a total cost figure for medical and rehabilitation expenses. Additionally, the insurance companies were requested to report the total number of days

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21/ The advantages and disadvantages of each of those data sources are discussed in Evaluation of the Bumper Standard, NHTSA Technical Report DOT HS 805 866, April 1981, pp. 3-9 ff.
22/ Ibid., p. 2.
23/ Impact of the Repeal of the Kansas Mandatory Motorcycle Helmet Law: 1975-1978, DOT HS 805 773, October, 1980. p. 82.

that the injured motorcyclist spent in the hospital and the total number of "disability days." 24/ Although the researchers considered the insurance companies "very cooperative," they received "relatively complete information" on only 13.9 percent (43) of the 309 motorcyclists included in the study. The researchers and NHTSA had failed to realize that the Kansas mandatory insurance law only required the purchase of liability insurance. It did not require that motorcyclists purchase insurance to pay for the injuries that they might receive. According to the State insurance commissioner's office, few motorcyclists insure themselves against personal injury because such coverage tends to be expensive. The researchers reported that information was received from 92 claims; however, in 53.2 percent of those claims, the insurance company reported that "the only coverage maintained by the owner of a motorcycle was for property damage." The report noted that 88 of the 309 motorcyclists (28.5 percent) did not report the accident to their insurance company.

**Automobile Fires**

In 1979 NHTSA entered an agreement with four insurance companies to collect reports for 1 year on all vehicle fires reported to those insurers in Illinois. The project originated with a desire by NHTSA's Office of Defects Investigation to obtain data on the extent of vehicle fires. Insurance companies were thought to be a potential source of the data that the agency felt it needed. Following preliminary discussions with representatives of State Farm and Allstate to establish mutual interest in the project, a meeting was held in May 1979 to determine the scope of the study and to establish protocols for the study. Allstate, State Farm, Kemper, and Economy Fire and Casualty insurance companies agreed to provide NHTSA with detailed reports of vehicle fire claims made in Illinois. Rather than using a retrospective review of claim files, the insurance companies and NHTSA decided to conduct a prospective study that would gather data as claims were submitted. The NHTSA agreed to compile and analyze the data. In consultation with the four companies, NHTSA developed a one-page reporting form that the companies distributed to their claim adjusters throughout Illinois.

From November 1979 through December 1980, the insurance companies sent the NHTSA more than 3,400 reports of vehicle fire claims. In December 1980, the NHTSA project director suggested that the project be terminated because, as he stated in a memorandum, the project had accomplished its objectives. Those objectives were: "to determine the approximate size of the motor vehicle fire problem, the potential origin and location of fires and, finally, to isolate specific make-model year vehicles which are overrepresented in the survey." 25/

The NHTSA weighed the incidence of vehicle fire claims against Illinois State vehicle registration. Of the four insurance companies that participated in the study, only one, State Farm, has a data system that is capable of readily establishing exposure. (That is to say, State Farm can easily determine the rate of fire claims per insured vehicle.) Using Illinois State vehicle registration to establish the rate of vehicle fires per vehicle registered, NHTSA determined that some makes and models of cars were overrepresented in the sample.

The data gathered from the insurers were turned over to NHTSA's Office of Defect Investigation. Engineering analyses were conducted in an attempt to detemine why some automobiles tend to catch fire more often than others. According to NHTSA's Office of Defect Investigations, the matter is still under study.

24/ Ibid., p. 114.
25/ Memorandum prepared by Ezio Cerrelli, NHTSA National Center for Statistics and Analysis, October 24, 1980. As of July 18, 1981, no report had been prepared.

**Child Restraint**

An atypical attempt to use insurance data is represented in a contract that NHTSA has with the League General Insurance Company to collect data on the benefits of child restraints in automobiles. In addition to its data-gathering potential, the larger project is also significant in the advantage it takes of an insurance company's loss-reducing self-interest to the betterment of society.

In June 1979, League General, a relatively small insurance company that sells insurance in Michigan, Minnesota, and Oregon, began a unique program of distributing free child restraints to its policyholders with children 4 years old and younger. Currently, the program is operating only in Michigan and Minnesota. Before the program officially began, NHTSA agreed to underwrite the expense of studying several aspects and the results of the effort. League General provided the Safety Board with a list of questions that its research will seek to answer and the research techniques it plans to use to find those answers:

> The general objective of the plan presented below is to determine as much as possible whether the League General program has resulted in greater use of child safety seats and reduced injuries and losses. The principal question to answer is whether free distribution is an effective and feasible approach, taking both costs and positive results into account. The study plan is also designed to use the League General program as an opportunity to gather information, particularly in the area of economic costs of injuries, that is needed generally in research on restraint use but is not readily available.
>
> The focus of the study is to answer the following questions:
>
> 1. Do League General seat recipients use child restraints more than other comparable groups?
>
> 2. What factors differentiate between users and nonusers of child restraints?
>
> 3. How do League General recipients evaluate the Trav-L-Guard seats and what improvements do they suggest? How do others evaluate other seats?
>
> 4. Why are child restraints used or not used and are they properly used? What are the reasons for misuse? Do the League General recipients differ from others on this question?
>
> 5. Is child restraint use related to adult restraint use among League General seat recipients and others?
>
> 6. Are people who make use of child or adult restraints more favorably inclined toward mandatory restraint laws?
>
> 7. To what degree has League General's program lowered the number and cost of claims to League General and to other insurance companies (e.g., health insurers)?
>
> 8. What real costs—medical and otherwise—result from injuries to children involved in crashes?

9. What is the balance between the costs and benefits of the League General program (quantified as much as possible in dollars) to the Company, the broader insurance community, and the public at large?

The study that we propose to answer the preceding questions includes five related tasks. These are:

1. An interview survey of seat recipients and a control group from the general population.

2. A longitudinal analysis of preprogram and postprogram claims experience.

3. An assembly of data on the comprehensive cost of child injuries.

4. A summary analysis of program cost effectiveness.

5. Preparation of a final report.

The personal interview survey is designed to gather quantitative data on use of restraints by children, adults' attitudes toward restraints and restraint-related issues, and background information that may explain differences between users and nonusers. The quantitative analysis of longitudinal claims experience is a straightforward attempt to measure the direct effect on claims. The assembly of data on cost of child injuries will expand the limited base of current information in this area by gathering information on costs to all parties who bear expenses resulting from injuries to children covered in claims to the Company.

The summary analysis of program cost effectiveness will attempt to compare program expense and injury cost reduction data, defined both narrowly (i.e., company-centered) and broadly (i.e., comprehensive), to see if there is a net positive effect. This analysis will also include a qualitative review of less measurable impacts (e.g., public goodwill, employee reaction, etc.).

Another unique aspect of this project is that it involves a formal contract between NHTSA and an insurance company. As far as the Safety Board can determine, NHTSA research projects with insurance companies generally involved no formal contract or financial compensation. In most cases, the exchange of information appears to have been based on a perception of mutual benefit.

**Passive Restraint Rulemaking**

Insurance companies have shown substantial interest in and support of the installation of passive occupant restraint systems in automobiles. Allstate and the IIHS have conducted tests of passive restraint systems. Studies sponsored by the insurance industry have added to the information that NHTSA has available in its evaluation of various restraint systems. Additionally, in evaluating the financial costs and savings associated with vehicle occupant restraints, NHTSA considers the 30-percent medical premium reductions that insurance companies offer for vehicles equipped with passive restraint devices.

In recent comments on NHTSA proposals to change its passive restraint standard (FMVSS 208), insurance companies and others referred to research based on insurance injury claims that shows that occupants of small cars are more at risk of serious injury

than occupants of larger cars. These data are compiled and published by the HLDI from insurance claims data contributed by its member insurance companies. The studies compare injury coverage claim frequency for 1974-1978 models. The data are drawn from "first party" injury coverages which pay for injuries that occur in the vehicle that is insured. They do not include payments for injury experienced by a "third party."

## INSURANCE DATA AND TRUCKING REGULATION

The Motor Carrier Act of 1980 removed a substantial number of barriers to the entry and operation of for-hire carriers in interstate commerce (Public Law 96-296). Section 30, of that Act requires the Secretary of Transportation to establish regulations for implementing minimum levels of financial responsibility requirements for all for-hire carriers engaged in interstate or foreign transportation of property and for all motor carriers that transport hazardous materials in either intrastate or interstate commerce. Under the financial responsibility requirements, a motor carrier must be able to certify that its own resources, or as is more often the case, resources available through the purchase of insurance, are at least sufficient to pay for losses that might occur up to a minimum level.

The House Committee report that accompanied the legislation speculated that changes "in the economic regulations of the motor carrier industry might have some impacts on safety." It explained that the financial responsibility requirements were intended "to encourage the carriers to engage in practices and procedures that will enhance the safety of their equipment so as to afford the best protection to the public."

The committee reasoned that "specifying minimum insurance levels is one way to help improve motor carrier safety. Insurance companies are equipped to evaluate the performance of the motor carriers. The premiums they assess are in direct relation to the risks they assume. Therefore, an unsafe carrier will have an increased premium, and a totally unsafe carrier may not be able to obtain the insurance necessary to operate, or, at best, will be at an insurance cost disadvantage."

As the statute requires, the Bureau of Motor Carrier Safety (BMCS) of the DOT's Federal Highway Administration (FHWA) has issued a regulation stipulating the minimum amount of insurance that will be required. The underlying implication in the financial responsibility requirements is that insurance companies are interested in and capable of projecting with some precision the loss potential of an individual carrier. (Often in the insurance business, "carrier" is used to indicate the company that insures or "carries" a particular risk. For the purposes of this report, "carrier" is used to refer to transporters of goods.)

A review of some insurance industry practices and data-handling techniques will aid in understanding the likelihood that these requirements will increase the safe operation of for-hire truckers. The basic reason for the existence of insurance is the need for protection against catastrophic losses. It is a mechanism for pooling resources against the possibility of a loss. Such a system is able to function because some of the participants in the pool will experience losses while others will experience no losses. Naturally, some can be expected to experience greater losses than others.

The "pool" consists of the number of risks that have enough similar characteristics to constitute a classification. A carrier's rate depends, in large part, on his classification. The insurance industry strives for the broadest possible classifications. The most commonly used classification plan is based on the distance that a carrier routinely hauls. The three classes are short-haul (50 miles or less), intermediate (150 miles or less), and

long-haul (more than 150 miles). The significance of these classifications is that insurance companies tend to record and report their loss data by these categories. Those losses are automated and consist entirely of dollar losses within broad categories.

As with private automobile insurers, commercial insurers automate very little of the claims data that they collect. Specific data collected on individual claims are generally considered confidential. Liberty Mutual Insurance Company is one of the larger insurers of commercial vehicles. 26/ The company's vice president for fleet loss control explained that the task of automating the myriad contributing and causal factors in any given crash would be costly, time-consuming, and of dubious value to his company.

For common carriers, the ability of insurers to devise rates (and thereby presumably create some incentive to gather data) on particular types of cargo is problematic. A common carrier may transport a nonhazardous commodity in 1 week, and then may transport goods that have the potential of creating substantial loss the next week. The difficulty arises in the multitude of possible cargoes and the equally diverse set of risks that might accompany the transportation of each cargo. Precise classification of that sort would create groups of carriers that would be too small to produce the exposure necessary to develop statistically reliable and stable experience necessary for rating. The insurance industry considers broadly based categories essential to its business. That is one reason for not collecting more precise data.

The ability of insurance companies to accurately assess the potential for loss created by an individual carrier, and to charge premiums accordingly, depends on the size of the carrier's operation. The larger the operation, the larger the exposure; the larger the exposure, the greater the opportunity to establish loss experience; the greater the opportunity to establish loss experience, the more closely a premium is based on the experience of the individual carrier. In other words, the larger the carrier, the more closely its premiums reflect its safety records. There is, of course, no industry-wide formula. However, it is generally acknowledged that individual experience begins to become a major factor when a carrier has five or more units in its fleet.

In this context, it is significant that the "Carrier Census" of the BMCS, which attempts to categorize carriers by fleet size and region, shows that of the 176,832 fleets in its April 1981 tally, 160,024 of them consist of six or fewer trucks. Many of the carriers in the census are private carriers (i.e., owned by the firm for which they carry goods) and thereby are exempt from the financial responsibility requirements. It is assumed that most of the carriers that will enter the market under the new regulatory environment will tend to begin with a small number of units. In fact, between July 1980 and April 1981, the number of 1-3 unit fleets in the BMCS Census jumped from 121 to 750. No other category experienced such a dramatic change. 27/

Many insurance companies, especially the larger companies, have loss control programs. Through these programs, insurers work with fleet operators to identify potential sources of losses and to suggest alternative methods that, hopefully, will reduce the potential for loss. According to insurance industry officials, loss control programs tend to consist of activities or practices that have evolved through experience and conventional wisdom. There is little, if any, scientific evidence that these programs or specific elements of these programs actually reduce losses. By their very nature and the methods by which they are implemented, scientific verification of their work in reducing

26/ Best's Insurance Management Reports, July 21, 1980.
27/ BMCS, Carrier Operational Classifications July 25, 1980 and April 3, 1981.

losses is unlikely. Nonetheless, substantial insurance company resources are devoted to loss control programs. However, insurance companies feel that economic considerations dictate that they concentrate their loss control efforts on larger fleets.

## ANALYSIS

The need for good data is essential to sound and efficient programs to reduce losses on American highways. Those data are necessary in problem identification, countermeasure development, and program evaluation. Historically, researchers in the highway safety community have shown much interest in the vast amounts of data that insurance companies gather. The perception is widely held that insurance companies have a wealth of data that might be useful to highway safety researchers and policymakers. Of all the data that insurance companies gather, the information in claim files is most often cited as a potential treasure trove for highway safety researchers. However, the Safety Board has found that, with the exception of claims data that insurance companies automate, insurance claim files are of little, if any, value.

First, the context in which those data are gathered provide reason enough for caution. Insurance company claim adjusters are not trained accident investigators. In fact, they seldom see the vehicles that were involved in a claim and almost never visit an accident site. The details of an incident are most often provided by involved parties, untrained in accident investigation, who are asked to accurately recall what happened in the seconds before what, in all probability, was an emotionally, if not physically traumatic event. Even if they could accurately recall the events, their own self-interest in the accident cannot be ignored. Some insurance companies supplement claim reports with a copy of the police report. However, highway safety researchers have found that police accident reports also are often not accurate accounts of an incident. Nonetheless, when judging the potential usefulness of insurance claim files in any research project, it should be remembered that an insurance company collects the minimum amount of information necessary to establish whether it must pay a claim. Following claim settlement, most insurance companies computerize very little of the information obtained during claim settlement. Common practice in the business is to computerize only that information needed for accounting purposes. Although practices vary from company to company, the data they automate is generally restricted to the total dollar amount of a claim, the type of coverage under which the claim was made, and perhaps the make, model, and the vehicle identification number. It is generally felt that those data that are not automated are too undependable, time-consuming, and costly to retrieve and too disruptive of routine insurance business to bother with. Perhaps the most telling commentary on insurance claim data is that they are seldom used in research conducted by the IIHS, the industry's primary highway safety research organization.

Other reasons that insurance data should be viewed with caution include:

- Bias -- Data from any single insurance company is biased because the segment of the population insured by any one company is not representative of the population at large. Marketing techniques and risk selection ensure an unrepresentative population.

- Uninsured Motorists -- A significant segment--at least 10 percent-- of the driving population does not purchase insurance. Many of those who do not purchase insurance tend to be considered high risk drivers for whom insurance would be expensive.

- Unreported Accidents -- Many crashes--especially those that involve minor damage--are not reported to insurance companies. In tort States,

an insurance company may never learn of a policyholder's crash involvement--even in serious crashes--if someone else was considered "at fault."

- Medical Costs -- Medical coverage on most automobile insurance policies is minimal. Most personal injuries resulting from vehicle crashes are compensated by group health insurance. Use of insurance data to estimate the medical costs resulting from crashes would result in gross underestimates of their cost to society.

- Timeliness -- Even if data from claims files were reliable, those files are not available until claims are closed. Processing of the simplest of claims may require several months. The time required to settle a claim increases as the complexity of the claim increases. Claims that involve injury invariably require substantially more time than claims for property damage.

Although the insurance claim system used by the MIC is far more extensive than any other insurance company, it cannot be viewed as a model for other insurance companies. It is safe to say that the company would not collect the vast amount of data it collects if the cost of collecting the data were not subsidized by GM.

Some Federal agencies, most notably NHTSA, have made repeated attempts to use insurance data in their research activities. The results of those efforts have been mixed. When researchers have appeared to understand their data source, results have been beneficial. The research efforts that were studied during the course of this evaluation illustrate the point.

NHTSA's unsuccessful effort to use raw insurance claim data to establish vehicle crashworthiness and damageability ratings and its futile attempt to use insurance data to establish the extent of medical costs associated with repeal of motorcycle helmet laws are examples of expecting more from insurance data than they are capable of revealing. Both efforts depended on claims data to provide answers to questions that were not specifically asked, nor necessarily of interest, when the claim was filed. Both efforts reflect a misunderstanding of the insurance business and its data-gathering practices. Also, advice from the insurance research community either was not sought or was ignored during the studies. Neither of these projects produced mearingful results from the insurance data that they sought to use.

On the other hand, there are several notable examples of NHTSA's beneficial use of insurance data. For example, NHTSA's bumper standard evaluation, fire incidence study, and child restraint assessment share a common theme: All three of the projects are characterized by the involvement of insurance company research staff. They were consulted during, or participated in, formulation of the research effort, which undoubtedly aided those research efforts to be successful in improving the understanding of the issues in question. People who work with any data on a daily basis tend to understand better the extent to which the data can be used in research. Just as important, they understand how to access the necessary information with minimum disruption to their day-to-day business.

NHTSA's bumper standard assessment used automated data from State Farm. Those data, already in a format conducive to analysis, had been collected during State Farm's routine data-sampling research program. NHTSA's use of the data created minimal disruption in the insurance company's day-to-day operation.

NHTSA's special study of automobile fires is illustrative of several points. Again, the most striking attribute is that insurance company representatives were early participants in the study design. They were able to steer the study away from a retrospective research design toward a prospective research design. The difference is significant. A restrospective research effort would have involved a survey of closed claim files. As we observed with efforts to establish vehicle ratings for crashworthiness and damageability, examinations of closed claim files are expensive, time-consuming, and disruptive and often fail to yield the data that are being sought. Instead of bogging down in closed claim files, claim adjusters from the four participating insurance companies used forms that were developed jointly by NHTSA and insurance companies, to collect specific data. The prospective research design allowed use of the insurance claim mechanism to gather the specific desired data, while avoiding the pitfalls that accompanied other attempts to use claim files.

NHTSA's special study of League General's child seat give-away program is an atypical, though significant, attempt to piggy-back research efforts on a manifestation of an insurance company's own economic self-interest. The insurance company believes that by giving car seats to its policyholders who have small children, it can potentially avoid claims by preventing catastrophic injuries of children. Catastrophic injuries, such as paraplegia or quadraplegia, suffered by a child can easily produce long-term medical claims in excess of several hundred thousand dollars. 28/ In this case, the insurance company and the NHTSA share an interest in determining whether the program actually achieves its intended goal of increasing the number of children who are properly restrained when they ride in automobiles.

The special study of the programs was developed jointly between NHTSA and the insurance company, with NHTSA paying for much of the research activity. The financial arrangement is not typical of NHSTA's efforts to use insurance data. Typically, insurance-related studies involve no remuneration of the insurance company for its data or the time expended by insurance company personnel.

By far, NHTSA has made more attempts to use insurance data then any other Federal agency. Recent efforts by the BMCS to establish financial responsibility requirements are the only known attempts within the FHWA to use insurance data. It is apparent from what is known about data routinely collected by insurance companies that they pay relatively little attention to highways. However, the IIHS and Nationwide Insurance Company have been active advocates of improved roadside design. FHWA could, for example, broaden its research efforts with a project, similar in design to NHTSA's survey of vehicle fires, that would use the claim-processing mechanism of insurance companies to survey the prevalence and cost of collisions with roadside structures.

Several clear themes emerged during this evaluation: The most successful attempts to use insurance data have been special projects that have avoided claim files and have involved, or sought advice from, insurance industry researchers. Throughout the evaluation, insurance company research officials and staff members of the insurance industry research organizations (the Insurance Institute for Highway Safety, the Highway

28/ League General initiated this program in Michigan, a State with unlimited no-fault medical benefits. Under such an insurance scheme, an insurer knows that it is liable for injuries that occur in the vehicle it insures. Therefore, an insurance company has a significant interest in and an increased opportunity to take steps to decrease potential loss.

Loss Data Institute, and the All-Industry Research Advisory Council) were helpful in their explanations of the data that are gathered and their limitations and potential uses. The Safety Board believes that any Federal agency that seeks to use insurance data in a research effort would benefit from similar guidance from these sources who are most familiar with the data.

A closer working relation between the insurance industry and DOT agencies would have advantages for the agencies, the insurance industry, and the public. The agencies would gain a better understanding of the extent to which insurance data and the insurance mechanism can be used in their research efforts. They would also benefit from the substantial knowledge of research design and research needs that members of the insurance research community possess. The insurance industry would benefit from an improved interchange with the agencies which have the regulatory authority to bring about changes that can reduce insurance industry losses. A better understanding of insurance data by Federal researchers would also tend to improve the efficiency with which they use the insurance mechanism in highway safety research efforts. Such increased efficiency would decrease the amount of time and resources wasted by industry and government on futile quests for data that may be inappropriate to answer the research questions that are being asked. Presumably, the public would benefit from improved traffic safety and decreased pressures on insurance companies to raise insurance rates.

## CONCLUSIONS

1. Insurance companies collect vast amounts of data, primarily intended for financial analyses necessary in the insurance business.

2. Historically, researchers and policymakers not associated with the insurance industry have expected more of insurance data than the data are capable of providing.

3. The reliability of data in insurance claim files for highway safety research is questionable. Retrieval of information from those files is disruptive and costly.

4. Very little information collected in the claim settlement process is automated by insurance companies.

5. Larger insurance companies tend to have sophisticated data-processing systems that small companies do not have. These and other resources that are available to larger companies make them more likely than smaller companies to participate in loss-reduction research activities.

6. Insurance companies individually, and the industry as a whole, have demonstrated an interest in research that can identify the source of transportation losses, in research to establish programs to reduce those losses, and in research to evaluate the effectiveness of loss reduction countermeasures. When that interest in research is shared by NHTSA, the FHWA, or other agencies, it should be used for mutual and public benefit.

7. Early involvement of insurance industry representatives who are familiar with insurance data will improve the chances for a successful research project.

8. Research efforts that can be shown to be of potential benefit to insurers are most likely to receive support and cooperation.

9. The most successful and least disruptive uses of insurance data have involved routinely automated data and prospective special studies rather than retrospective studies that attempt to extract answers from claim files.

10. Insurance data are best able to provide a broad view of trends that could indicate that a problem exists.

## RECOMMENDATIONS

As a result of this safety effectiveness evaluation, the National Transportation Safety Board recommends that:

—the Secretary of Transportation:

Direct the National Highway Traffic Safety Administration and the Federal Highway Administration to meet, within a year, with the All-Industry Research Advisory Council to establish a consultative arrangement that the agencies would use for guidance in the planning and effective execution of highway and motor vehicle safety research projects using data collected by the insurance industry. (Class II, Priority Action) (H-81-46)

—the All-Industry Research Advisory Council:

Cooperate with the National Highway Traffic Safety Administration and the Federal Highway Administration in establishing a consultative arrangement that the agencies would use for guidance in the planning and execution of highway and motor vehicle safety research projects using data collected by the insurance industry. (Class II, Priority Action) (H-81-47)

**BY THE NATIONAL TRANSPORTATION SAFETY BOARD**

/s/ JAMES B. KING
Chairman

/s/ ELWOOD T. DRIVER
Vice Chairman

/s/ PATRICIA A. GOLDMAN
Member

/s/ G. H. PATRICK BURSLEY
Member

FRANCIS H. McADAMS, Member, did not participate.

August 25, 1981

# APPENDIXES

## APPENDIX A

## INSURANCE APPLICATION FORM

NEW ☐ REINS. ☐ TRANS. ☐

**APPLICATION FOR STATE FARM AUTOMOBILE INSURANCE** — OFFICE COPY

VEH HOUSE-HOLD | VEH STATE FARM | QUALIFYING POLICY NO. | CURRENT CLASS | NEW CLASS | REPLACES POLICY NO | Office Use

**APPLICANT**

NAME PLEASE PRINT — LAST NAME | FIRST NAME | MIDDLE NAME OR INITIAL

MAILING ADDRESS — NUMBER AND STREET | CITY | STATE | ZIP CODE

RESIDENCE If other than Mailing Address — NUMBER AND STREET | CITY | STATE | ZIP CODE | COUNTY | HOME TELEPHONE NO

EXACT LOCATION of residence, if no street number used | FORMER ADDRESS If in community less than 6 months

OCCUPATION | EMPLOYER | YEARS WITH THIS EMPLOYER | ADDRESS OF EMPLOYMENT

During the past 3 years, has the applicant, any household member or any regular driver:
a. Had license to drive or registration suspended, revoked or refused? Yes ☐ No ☐
b. Been the driver in any automobile accident or loss? Yes ☐ No ☐
c. Been convicted (or forfeited bail) for traffic violations? Yes ☐ No ☐
d. Been fined or imprisoned or been on probation or parole for any non-motor vehicle offense? Yes ☐ No ☐

DOES THE APPLICANT OR ANY REGULAR DRIVER HAVE ANY 1. PHYSICAL LIMITATIONS OR 2. MENTAL DEFECTS? IF YES, EXPLAIN IN REMARKS. Yes ☐ No ☐

MOST RECENT LIABILITY INSURER | COMPANY-EXPLAIN IF NONE | POLICY NO. | MONTH-DAY-YEAR FROM | MONTH-DAY-YEAR TO

**DRIVERS**

| LIST ALL DRIVERS | DRIVER'S LICENSE NO./STATE | BIRTHDATE MO DAY YR | LICENSED 3 YEARS YES | If No, One Year Issued | OCCUPATION | SEX M F | RELATIONSHIP TO APPLICANT | MARITAL STATUS S M D W SP | % DRIVING VEH 1 | VEH 2 | VEH 3 | VEH 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 APPLICANT | | | | | APPLICANT | | APPLICANT | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |

**VIOL. & ACC.**

| DRIV. ER NO. | CHECK (√) VIOL. | ACC. | NATURE OF VIOLATIONS OR DETAILS OF ACCIDENTS (Dates, damages, injuries or deaths, and how accident occurred) | CHARGEABLE NO | YES-AMT. PAID |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**VEH.**

YEAR | MAKE AND MODEL | BODY TYPE | CYLS. | VEHICLE IDENTIFICATION NO.

MO/DAY/YR. PURCHASED | COST PRICE NEW $ | USED MOTOR VEHICLES, MOTOR HOMES AND CUSTOMIZED VEH. ONLY | MODIFIED CAMPER COST NEW $ | FOR HIGH PERFORMANCE VEH. AND MOTORCYCLES ONLY: ENGINE DISPLACEMENT C.C. OR C.I.D. | HORSE-POWER | EXISTING DAMAGE OR MODIFIED | NO | YES-DESCRIBE

LIENHOLDER | MAILING ADDRESS | ZIP CODE

**RATE**

| YRLY. MILEAGE NO. | DRIVER TO AND FROM WORK/SCHOOL AVERAGE WEEKLY | ANNUAL MILEAGE | BUS. USE YES NO | FARM RATE YES NO | 2 CAR RULE YES NO | DRIV. TRN. YES NO | G.S. DISC. YES NO | CHILD AT SCH. YES NO | RATING GROUP | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

**The insurance applied for is only for the coverages indicated by specific premium entry. If premium cannot be entered, check boxes to indicate coverage requested.**

**COVERAGES**

| | | MEMB. | PREMIUM |
|---|---|---|---|
| BIPD LIMITS | / / | AB ☐ | |
| MED. PAY. LIMITS | | C ☐ XX | |
| COMPREHENSIVE | DEDUCTIBLE Amount | D ☐ | |
| 80% COLLISION | | F ☐ | |
| DEDUCTIBLE COLLISION | DEDUCTIBLE AMOUNT | G ☐ | |
| TOTAL BASE PREMIUM | | | |
| RATING FACTOR (%) | | | |
| BASE X FACTOR TOTAL | | | |
| EMERGENCY ROAD SERVICE | | H ☐ XX | |
| RENTAL REIMBURSEMENT | R R1 ☐ ☐ | R ☐ | |
| UNINSURED MOTOR VEH. | | U ☐ XX | |
| AUTO DEATH INDEMNITY SPECIFIC DISABILITY | COMPLETE AD & D (S, T, Z) SECTION | S ☐ | |
| TOTAL DISABILITY | | T ☐ XX | |
| LOSS OF EARNINGS | | Z ☐ XX | |
| SPECIAL EQUIPMENT COVERAGE BUYBACK (CB, TAPE PLAYER, ETC.) | $300 OR LESS DED. $100 ☐ ☐ | ☐ XX | |
| ENDORSEMENTS | | TOTALS | |

MFP ACCOUNT NO. | REMITTANCE RECEIVED $ | BALANCE DUE $

**AB & D (S, T, Z)**

FULL NAME OF PERSONS TO BE INSURED — ONLY PERSONS IN APPLICANT'S HOUSEHOLD ARE ELIGIBLE | S PRINCIPAL SUM AMOUNT | PREM | 1 OR 2 | T OR Z PREMIUM | ANY OTHER AUTO CO. TO

AS TO EACH PERSON NAMED FOR COVERAGE T:
Is he in good health and engaged in a remunerative occupation? YES ☐ NO ☐
Is the sum of his weekly indemnity and all his personal accident insurance less than ⅔ of his average weekly earnings during the past 12 months? YES ☐ NO ☐

DATE AND TIME OF APPLICATION — MO. DAY Y. ☐ AM ☐ PM

AGENT'S CODE STAMP

MUTUAL COMPANY POLICY BOOKLET DELIVERED TO APPLICANT — DATE

**BINDER** — EFFECTIVE DATE

☐ STATE FARM MUTUAL AUTOMOBILE INSURANCE COMPANY | ☐ STATE FARM FIRE AND CASUALTY COMPANY

of Bloomington, Illinois, hereby binds as of the requested effective date for a period of 30 days from such date the insurance applied for, subject to all of the terms and conditions of the automobile policy and applicable endorsements in current use by such Company. The issuance by the Company of the Declarations page of the policy applied for voids this binder.

AGENT'S SIGNATURE X _____

I hereby apply for the insurance indicated and represent (1) I have read this application, (2) the statements herein, including those made on any other application for automobile insurance to this company this date and which are incorporated by reference and made part of this application, are correct, (3) I am the sole owner of the described vehicle except as otherwise stated, and (4) the limits and coverages were selected by me. **IT IS UNDERSTOOD AND AGREED THAT NO INSURANCE IS EFFECTIVE HEREUNDER (A) UNLESS THE BINDER IS COMPLETED DESIGNATING THE COMPANY ACCEPTING THIS APPLICATION AND SIGNED BY AN AUTHORIZED AGENT OF SUCH COMPANY OR (B) UNTIL THE DATE OF THE POLICY OR BINDER ISSUED BY THE COMPANY ACCEPTING THIS APPLICATION.**

APPLICANT'S SIGNATURE X _____

AG 4089DC 8 PRINTED IN U.S.A.
INDICATE REMARKS ON REVERSE

OFFICE USE ONLY — UIC | MFR CODE | PRIOR DAMAGE | BASIC POLICY

# APPENDIX B

## AUTOMOBILE CLAIM REPORT

APPLICABLE ONLY IN CALIFORNIA - FOR YOUR PROTECTION CALIFORNIA LAW REQUIRES THE FOLLOWING TO APPEAR ON THIS FORM. IT IS UNLAWFUL TO: (A) PRESENT OR CAUSE TO BE PRESENTED ANY FALSE OR FRAUDULENT CLAIM FOR THE PAYMENT OF A LOSS UNDER A CONTRACT OF INSURANCE, (B) PREPARE, MAKE OR SUBSCRIBE ANY WRITING, WITH INTENT TO PRESENT OR USE THE SAME, OR ALLOW IT TO BE PRESENTED OR USED IN SUPPORT OF ANY SUCH CLAIM. EVERY PERSON WHO VIOLATES ANY PROVISION OF THIS SECTION IS PUNISHABLE BY IMPRISONMENT IN THE STATE PRISON NOT EXCEEDING THREE YEARS, OR BY FINE NOT EXCEEDING ONE THOUSAND DOLLARS, OR BY BOTH

**AUTOMOBILE CLAIM REPORT** — CLAIM NUMBER

| | | | | | |
|---|---|---|---|---|---|
| ♦ INSURED | | BASIC NO POL. NO. | STATE CODE | CHANGE CODE | CAR NO |
| ♦ ADDRESS (NUMBER AND STREET - CITY - STATE - ZIP CODE) | | | PHONE | | |
| TIME AND PLACE OF ACCIDENT OR LOSS ♦ DATE | TIME | STREET OR HIGHWAY | CITY OR COUNTY | STATE | |
| VEH 1. INSURED'S VEHICLE (YEAR - MAKE - MODEL SERIES - BODY STYLE) | | | PRIOR DAMAGE | NO | YES - DESCRIBE |
| IDENTIFICATION NUMBER | LICENSE NUMBER | | IS THIS THE VEHICLE INVOLVED IN THIS ACCIDENT? | NO | YES |
| DRIVER | | | OCCUPATION | AGE | PHONE |
| ADDRESS (NUMBER AND STREET - CITY - STATE - ZIP CODE) | | | | RELATIONSHIP TO INSURED | |
| UNDER WHOSE AUTHORITY WAS VEHICLE BEING DRIVEN? | | | WAS DRIVER ON MISSION FOR OWNER? | NO | YES - PURPOSE OF TRIP |
| PRINCIPAL DAMAGE | | | DRIVE IN SERVICE? | NO | YES - OFFICE / WHERE IS VEHICLE? |
| VEH 2. OTHER VEHICLE (YEAR - MAKE - BODY STYLE) | | | LICENSE NUMBER | | |
| OWNER | | ADDRESS (NUMBER AND STREET - CITY - STATE) | | PHONE | |
| DRIVER | AGE | ADDRESS (NUMBER AND STREET - CITY - STATE) | | PHONE | |
| PRINCIPAL DAMAGE | | | DRIVE IN SERVICE? | NO | YES - OFFICE / WHERE IS VEHICLE? |
| NAME OF INSURANCE COMPANY | | ADDRESS | | POLICY NUMBER | |

FACTS OF ACCIDENT

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DISTANCE (IN FEET) FROM OTHER CAR WHEN DANGER FIRST NOTED | SPEED LIMIT IN AREA OF ACCIDENT | SPEED WHEN DANGER FIRST NOTED | INSD. VEH. | OTHER VEH. | SPEED AT IMPACT | INSD. VEH | OTHER VEH. | SIGNAL GIVEN | INSD VEH | OTHER VEH | | | | |
| ROAD CONDITIONS | HEADLIGHTS ON? | INSD. VEH. NO / YES | OTHER VEH. NO / YES | DEPRECIATION - ITEM | COST | AGE | MILEAGE OR CONDITION | AGREED DEDUCTION | COMPANY PORTION | | | | | |
| TRAFFIC CONTROL | NO | YES - TYPE | | WERE POLICE THERE? | NO | YES | WHO RECEIVED TICKET? | VIOLATION | | | | | | |
| INJURIES VEH 1. | NO | YES - IDENTIFY (NAME - ADDRESS - INJURIES) | | | | | | | | | | | | |
| INJURIES VEH 2. | NO | YES - IDENTIFY (NAME - ADDRESS - INJURIES) | | | | | | | | | | | | |
| WITNESSES | NO | YES - IDENTIFY (NAME - ADDRESS) | | | | | | | | | | | | |
| THEFT | PARTIAL - NAME ITEM | ENTIRE VEHICLE | TIME | PLACE | LAW OFFICERS NOTIFIED | NO | YES - DATE | VEHICLE RECOVERED | NO | YES - DATE | | | | |

I hereby declare that the facts stated in this report are true and accurate.

| | | | |
|---|---|---|---|
| INSURED SIGN HERE X | DATE | DRIVER SIGN HERE X | DATE |

| | | | | | |
|---|---|---|---|---|---|
| COVERAGES IN FORCE | COVERAGES INVOLVED | DATE REPORTED TO AGENT | HAS AN SR 21 BEEN FILED, IF NECESSARY? | YES | NO - WHY NOT? |
| AGENT | CODE NO. | PHONE | REPORT TAKEN BY | DATE | |
| INSURED VEHICLE ASSIGNED TO | DATE | OTHER VEHICLE ASSIGNED TO: | | DATE | |

♦ USE OTHER SIDE IF NECESSARY ♦

APPENDIX B

STATE FARM INSURANCE COMPANIES ●Home Office Bloomington, Illinois

**REPAIR ESTIMATE**

CLAIM NO. _____ DATE OF INSPECTION & ESTIMATE _____ WHERE INSPECTED _____

OWNER _____ LICENSE NUMBER _____

ADDRESS _____ TEL. NO. _____

| MAKE | YEAR | SERIES | BODY STYLE | MOTOR OR SERIAL NUMBER | SPEEDOMETER READING |
|---|---|---|---|---|---|
| | | | | | |

| REPAIR | REPLACE | DESCRIPTION | PARTS @ LIST | LABOR HRS. | REFINISHING HRS. | PAINT MATERIALS & NET ITEMS |
|---|---|---|---|---|---|---|
| | | | $ | | | $ |
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| | | | | | | |
| | | | | | | |
| | | TOTAL | $ | | | $ |

*THIS IS NOT AN AUTHORIZATION TO REPAIR*

LABOR HRS._____

REFINISHING HRS._____

TOTAL LABOR HRS._____ X $_____ PER HR. = $_____

PARTS @ LIST $_____

LESS_____ % DISC. $_____

NET PARTS PRICE $_____

SALES TAX $_____

PAINT, MATERIALS & NET ITEMS $_____

**OWNER PAYS TOTAL REPAIR COST $_____**

_____
STATE FARM CLAIMSMAN

G 8833.2

APPENDIX C

DESCRIPTION OF THE HLDI DATA SYSTEM 1/

# HLDI data system

The Highway Loss Data Institute calculates from insurance data the number and extent of losses associated with various motor vehicles types. Specifically, HLDI calculates how many claims there are per insured vehicle year for each vehicle type, and how much these claims cost in terms of insurance payments for human injuries, vehicle damage, or theft. The system through which HLDI derives results from insurance data is described below.

## Types of Insurance Data Collected

Major insurers make available to HLDI large volumes of computerized data which are used to compare the loss experience of various vehicles. HLDI collects data only from insurers' first-party coverage files (i.e., those under which the policyholder collects compensation for losses from his own insurer). Data from three types of first-party insurance coverages are included in the HLDI system:

- **Injury Coverage:** The medical insurance data collected by HLDI are from Personal Injury Protection (PIP) coverage, which is sold in states with "no-fault" insurance. This coverage provides reimbursement for the medical and other related losses sustained by the occupants of insured vehicles in crashes without regard to who was considered to be "at fault." States with no-fault insurance requirements generally restrict the right to make claims against the other involved parties; as a result, more crash injury claims are paid under PIP coverage in these states than under first-party medical coverages in states without no-fault insurance. Thus, PIP coverage provides the most complete automobile medical insurance data concerning occupant injuries. It should be recognized, however, that even in states with no-fault insurance, PIP coverage does not provide a full account of all occupant crash injuries requiring medical treatment. Other sources of reimbursement may also be used—for example, group health insurance coverage.
- **Vehicle Crash Damage Coverage:** The vehicle crash damage insurance data collected by HLDI are from collision coverage, which provides reimbursement for vehicle damage sustained in crashes.
- **Vehicle Theft Coverage:** The vehicle theft insurance data collected by HLDI are from comprehensive coverage, which provides reimbursement for a number of non-crash losses—e.g., vehicle theft, non-crash fires, and vandalism.

Under each of these first-party coverages, HLDI collects data about vehicles for which claims are filed, as well as data about the larger population of insured vehicles which are included in the HLDI system. *For each insured vehicle,* HLDI collects information on the type and dates of coverage, the age or age group of the insured operator, the location where the vehicle is normally garaged, and any deductible amounts that could affect the size of claim payments. *For each insured vehicle involved in a crash for which a claim is filed,* HLDI collects information on the coverage under which the claim is made as well as the date and amount of the loss. However, HLDI includes in its results *only claims for losses that occur while insurance coverage is in effect;* each claim submitted to HLDI is carefully matched with coverage information to be sure no claims are included outside coverage dates.

For claims under injury coverage, payments are identified as medical loss, wage loss, or other economic loss; only medical losses are used in the computation of injury loss experience. For claims under comprehensive coverage, HLDI collects information on the type of insurance loss involved—i.e., whether payments are made for fire, theft or vandalism; only theft loss data are used in the computation of HLDI results.

## Vehicle Identification

HLDI's data system is designed to compare vehicles and their characteristics; the "key" to this system is accurate, specific vehicle information. The item in the HLDI data files which provides such information is the Vehicle Identification Number (VIN).

The VIN from each new passenger vehicle sold in the United States can be decoded to provide information on its make, model year, series, body style, and engine. Using secondary sources, it is also possible to derive an estimate of each vehicle's weight and horsepower.

To use VINs in its data system, HLDI has developed computer software, called VINDICATOR, which analyzes and decodes the VINs of nearly all the passenger cars and multipurpose vehicles sold

1/ Excerpted from "The Highway Loss Data Institute," copyright 1981 by the Highway Loss Data Institute. Reprinted with permission.

in the United States since 1966. VINDICATOR is updated annually and is widely used by other organizations, including state and federal agencies and many insurers. The VINDICATOR program is available on request.

## Claim Frequency

HLDI uses the insurance and vehicle identification information described above to compute claim frequencies. To compute these, it is necessary to know not only how many claims for a particular vehicle type are filed, but also how many such vehicles are insured during a given calendar period. The latter figure provides a measure of the *exposure to the likelihood of a claim* for each vehicle type.

Exposure is measured by computing the length of time each individual vehicle is insured under each coverage. The total exposure for each vehicle type—measured in numbers of insured vehicle years—is obtained by accumulating the length of time each vehicle of that type has been insured under the specified coverage. For example, if HLDI has data on 10,000 individual vehicles of a particular type, each of which has had collision coverage in effect for a six-month period, then the total collision coverage for that particular vehicle type would be 5,000 insured vehicle years.

*A claim frequency result is produced by dividing the number of claims for a vehicle type by the number of insured vehicle years for the same vehicle type.* For injury and comprehensive coverages, claim frequencies are reported in terms of the number of claims per 1,000 insured vehicle years of exposure. For collision coverages, under which more claims are filed, claim frequencies are reported in terms of the number of claims per 100 insured vehicle years of exposure.

## Loss Payments: Collision and Comprehensive Coverages

Under these coverages, HLDI calculates *average loss payments* by adding all of the payments for losses associated with a vehicle type, and then dividing the sum by the number of claims paid.

HLDI also computes a figure that combines a particular vehicle's collision or comprehensive claim frequency and average loss payment. This figure, the *average loss payment per insured vehicle year*, is obtained by multiplying the claim frequency by the average loss payment amount and then dividing the product by 100 (for collision losses) or by 1,000 (for comprehensive losses). This result is the average insurance loss for a single vehicle operated for one year under the specified coverage.

## Loss Payments: Injury Coverage

Some crashes result in injuries of such severity that medical payments continue for very long periods of time. The average loss payments of such claims increase as longer periods of time are considered. Consequently, stable average loss payments and loss payments per insured vehicle year cannot be computed on a timely basis for injury coverage. HLDI assesses the magnitude of injury losses for various vehicle types by measuring the frequencies of claims with payments exceeding certain dollar thresholds—currently $250, $500, and $1,000.

## Non-Vehicle Factors

HLDI findings largely reflect differences in the characteristics of specific vehicle types. However, a vehicle's insurance losses can also vary substantially because of non-vehicle factors. Two important non-vehicle factors which HLDI takes into account are the age of the insured operator and the size of the deductible.

**Operator age:** Younger operators generally have more frequent and more severe crashes than older operators. Since vehicle types being compared may have substantially different percentages of youthful operators, this factor is taken into account to avoid distortion of HLDI findings.

HLDI computations utilize two operator age groups, youthful and non-youthful. Youthful operators are defined as all males (married or single) under 25 years old, and all unmarried females under 25 years old. All other operators are classified as non-youthful. These operator age groups are derived from the variety of insurance-rated operator classification plans in use in the various states.

HLDI collects information on one rated driver for each insured vehicle. This is the driver who, for insurance purposes, is considered to represent the highest loss potential. For example, in a family with two insured vehicles and three operators, two adults and one teenager, the teenager would be the rated operator of the car he or she drives most frequently; one of the adults would be the rated operator of the other car.

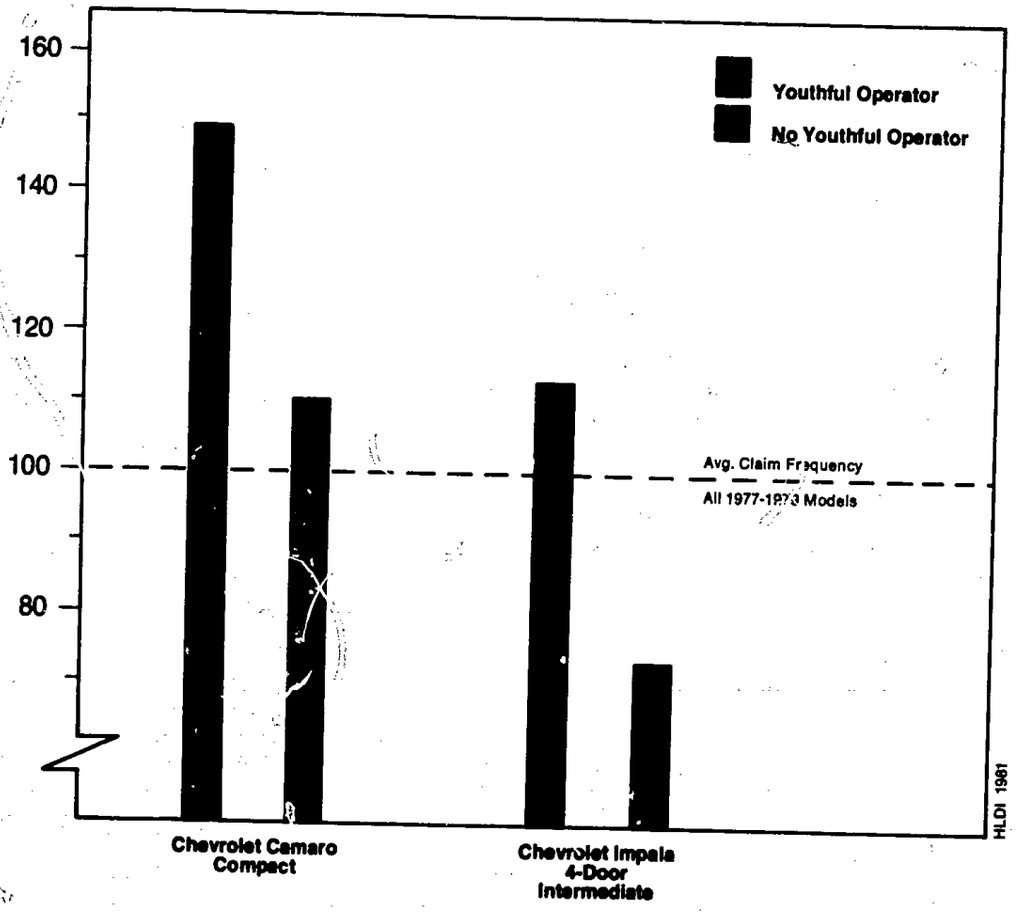
Figure 33 illustrates the influence of operator age groups on relative injury claim frequencies for two 1977-1979 model year Chevrolet cars—the Camaro, a compact, and the Impala four-door, an intermediate. The results are shown in relative terms, *with 100 representing the average injury claim frequency for all 1977-1979 models.* The Camaro had a relative claim frequency of 149 for the youthful operator group; that is, its claim frequency for youthful operators

was 49 percent higher than the overall frequency for all 1977-1979 model cars. The result for the Camaro's non-youthful operator group was 110. The relative claim frequency results for the Impala also differed substantially by operator age group—112 for the youthful operator group, and 73 for the non-youthful group.

Clearly, the relative mix of exposure for operator age groups affects a vehicle's overall loss results. If the Camaro, for example, has more of its exposure with youthful operators than the Impala, then the Camaro's overall loss result is more influenced by this non-vehicle factor than is the Impala's. In HLDI reports, differences in the mix of exposure by operator age group are adjusted through the *standardization* procedure described on pages 26-29.

**Deductibles:** Another important non-vehicle factor that affects collision and comprehensive coverage results is the size of the deductible (i.e., the portion of the loss paid by the insured). This factor affects both the frequency of claims and the size of average loss payments. Higher deductibles result in lower frequencies of claims and higher average claim payment amounts. Thus, if there are differences in deductibles among different vehicle types, then this factor (unless appropriately taken into account) could affect HLDI comparisons of vehicles' losses. Differences in deductibles, if not taken into account, could also affect comparisons of losses for the same vehicle type over time, since there has been a trend toward higher deductibles in recent years.

**FIGURE 33**
**Personal Injury Protection Coverage**
**Relative Claim Frequencies by Operator Age Group**
**1977-1979 Models**



## Standardization

To avoid bias in the HLDI results associated with operator age and deductible amounts, the findings are weighted so that each vehicle's loss result is based on exactly the same proportions of exposure for each applicable non-vehicle factor. This procedure, referred to as *standardization*, has long been used by statisticians in public health and other fields. Under injury coverage, HLDI results are standardized to the same mix of exposure for youthful and non-youthful operator age groups only, since deductibles generally do not apply. Under collision and comprehensive coverages, HLDI results are standardized to the same mix of exposure for both operator age group and deductible.

The following examples illustrate the effects of standardization on HLDI results. As stated earlier, figure 33 shows the injury claim frequency results of the 1977-1979 model Chevrolet Camaro and Impala for each operator age group. Figure 34 shows that almost half of the Camaro's exposure was with youthful operators as rated drivers, compared to less than ten percent for the Impala. Differences of this magnitude are common when comparisons are made between cars of different sizes. In general, the smaller the car, the higher the percentage of exposure with youthful operators.

Figure 35 shows the relative injury claim frequency results for these two cars using the *actual* mix of exposure for the two operator age groups, and the results using the same or *standardized* mix. Comparisons between the standardized results for the Camaro and the Impala are not distorted by the different mix of exposure between youthful and non-youthful operator groups, because the data have been weighted to make the comparisons. In the case of the Camaro, which had a high percentage of youthful exposure, the standardized result was lower than the actual result because the contribution from the youthful operator group was reduced. On the other hand, for the Impala the standardized result was higher than the actual result, since standardization increased the contribution from the youthful operator group. HLDI generally publishes standardized as well as actual results in order to facilitate valid comparisons among vehicle types.

**FIGURE 34**
**Personal Injury Protection Coverage**
**Percent of Exposure by Operator Age Group**
**1977-1979 Models**

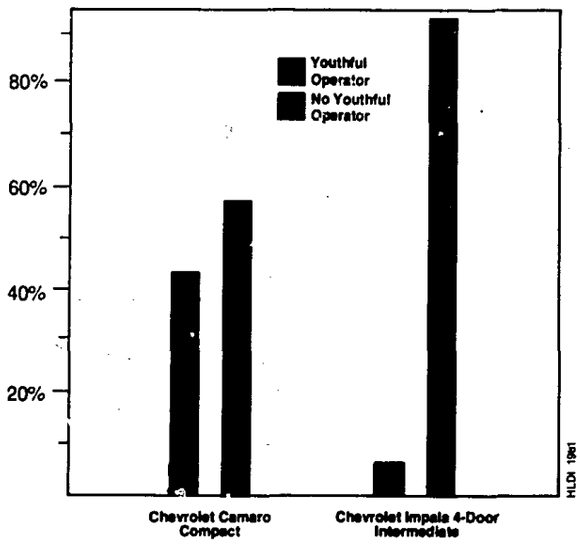
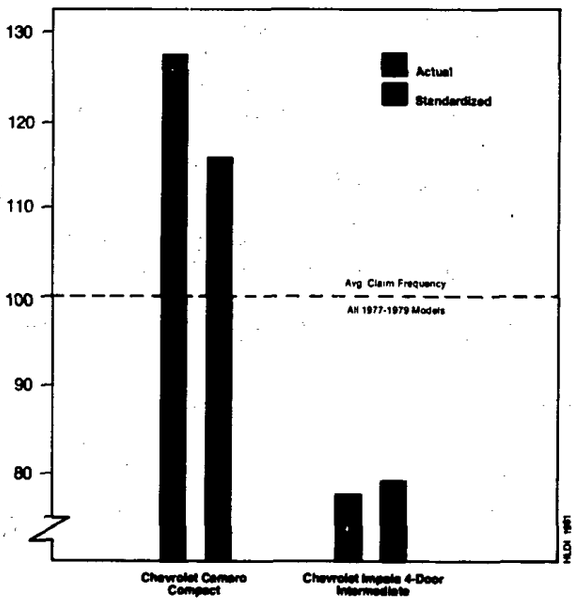



**FIGURE 35**
**Personal Injury Protection Coverage**
**Relative Claim Frequencies—Actual and Standardized**
**1977-1979 Models**



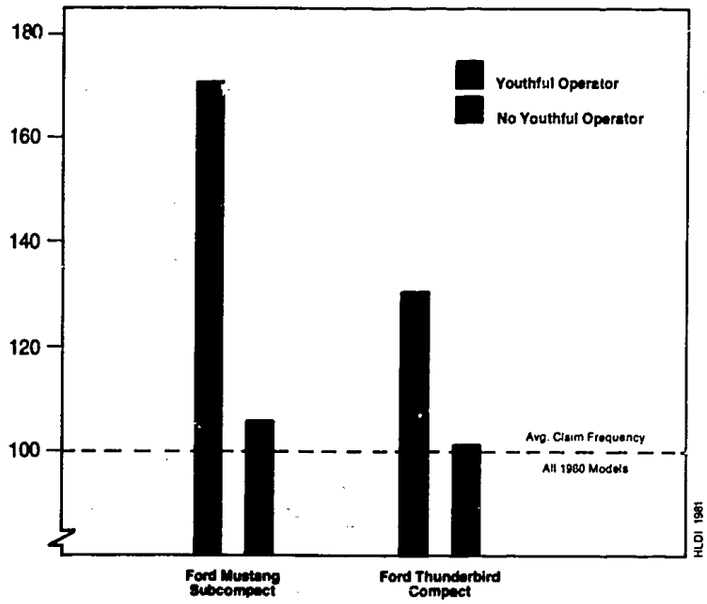
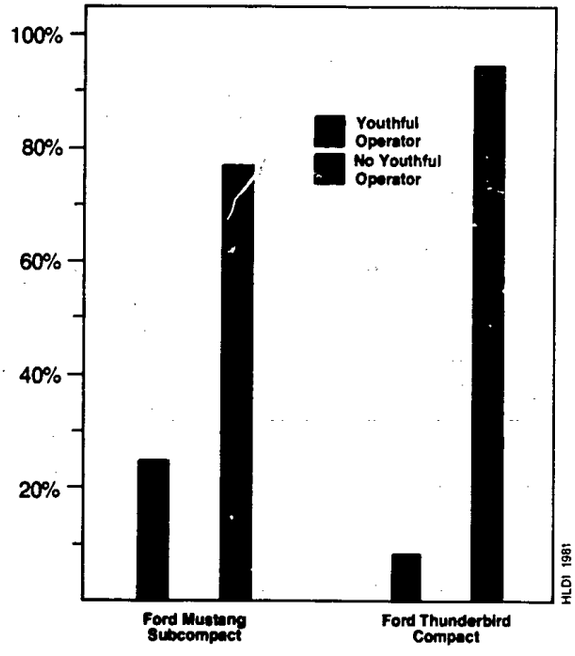



**FIGURE 36**
**Collision Coverage—Deductible <$150**
**Relative Claim Frequencies by**
**Operator Age Group**
**1980 Models**

Figures 36-38 illustrate the effects of operator age groups on collision results, using data from two 1980 model Ford cars—the Mustang, a subcompact, and the Thunderbird, a compact. The relative collision coverage claim frequency results for deductibles less than $150 for the two cars are presented in Figure 36. For the non-youthful operator age group, the Mustang had a relative claim frequency of 106, while the Thunderbird had a frequency of 102. (Again, 100 represents the average for all 1980 models.) The youthful operator groups had significantly higher relative claim frequencies—171 for the Mustang, or 71 percent higher than average; and 131 for the Thunderbird, or 31 percent higher than average. Figure 37 shows that the Mustang had 24 percent of its collision coverage exposure with youthful operators, compared to only 6 percent for the Thunderbird.

**FIGURE 37**
**Collision Coverage—Deductible <$150**
**Percent of Exposure by Operator Age Group**
**1980 Models**



Both *actual* and *standardized* results for these two cars are shown in Figure 38. The actual result was 122 for the Mustang and 104 for the Thunderbird. When the results were standardized to the same mix of exposure for each operator age group, the relative collision coverage claim frequencies for the two cars become closer—116 for the Mustang and 106 for the Thunderbird.

Figures 39-41 illustrate the effects of deductible differences on collision coverage results. Figure 39 shows the relative average claim size results for non-youthful operators for two 1980 model specialty cars—the Chevrolet Monte Carlo, a compact, and the Cadillac Eldorado, an intermediate. For both cars, higher deductible amounts resulted in higher average claim payment amounts. Figure 40 shows that the Monte Carlo had almost 30 percent of its exposure with higher deductibles compared to almost 50 percent for the Eldorado. Figure 41 shows the *actual* and *standardized* relative average loss payment amounts for these two cars: 88 for the Monte Carlo compared to 129 for the Eldorado. After standardization the Monte Carlo's result remained 88, whereas the Eldorado's result was reduced from 129 to 123.

The effects of differences in these non-vehicle factors, operator age group and deductible amount, can be marked. Thus, HLDI presents *standardized* as well as *actual* results in most of its reports. In the case of injury coverage, which generally does not have a deductible, results are standardized for operator age group only. For collision and comprehensive coverages, results are standardized for both operator age group and deductible amount. Unless otherwise noted, all results shown in this publication are standardized.

**FIGURE 38**
**Collision Coverage—Deductible < $150**
**Relative Claim Frequencies—Actual and Standardized**
**1980 Models**

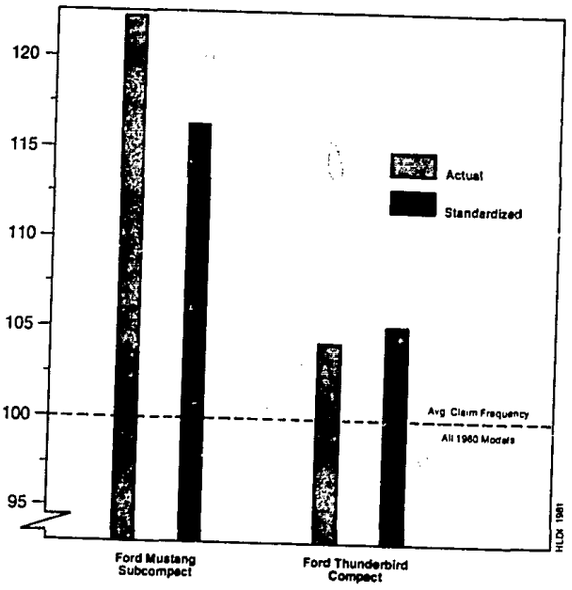



**FIGURE 39**
**Collision Coverage—No Youthful Operator Age Group**
**Relative Average Loss Payments by Deductible Group**
**1980 Specialty Models**

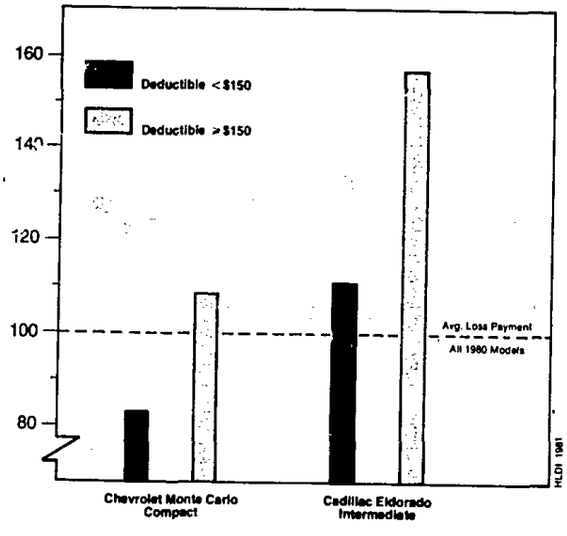


**FIGURE 40**
**Collision Coverage—No Youthful Operator Age Group Percent of Exposure by Deductible Group 1980 Specialty Models**

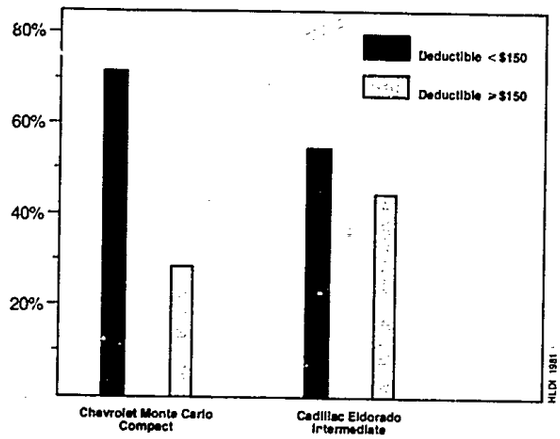
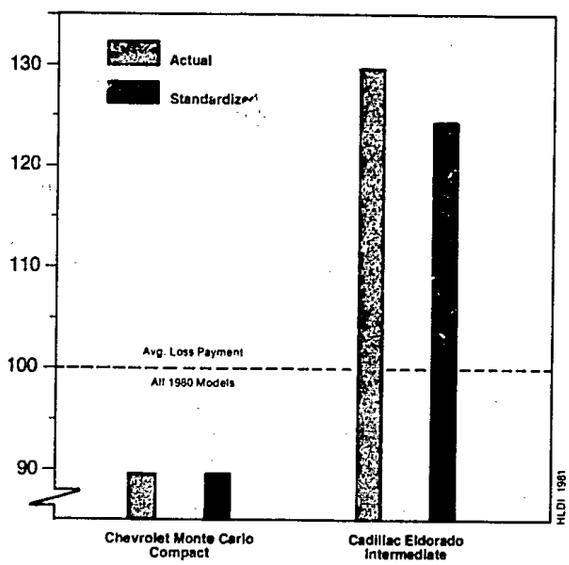



**FIGURE 41**
**Collision Coverage—No Youthful Operator Age Group Relative Average Loss Payments—Actual and Standardized 1980 Specialty Models**



# APPENDIX D

## GM "620 SURVEY REPORT"

MOTORS INSURANCE CORPORATION

# 620 SURVEY REPORT

**COMPLETE ENTIRE SURVEY FOR ALL COLLISION LOSSES INVOLVING ANY MIC INSURED GM VEHICLE LISTED IN QUESTION ONE.**

CIM INSURANCE CORPORATION

**1. VEHICLE:** (Check one)
- ☐ 79-81 LUV TRUCK
- ☐ 79-81 "T" CHEVETTE, T1000.
- ☐ 80-81 "X" CITATION,OMEGA,PHOENIX,SKYLARK.
- ☐ 82 "J" CAVALIER,CIMARRON,J-2000.

**2. V.I.N.** ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

**3. DATE OF LOSS:** ____ MO. — ____ DAY — ____ YR. ____ TIME ☐ A.M. ☐ P.M.

**4. INSURED'S NAME:** _____

**5. POLICYNUMBER:** _____

**6. CLAIM BRANCH CODE:** ☐☐☐

**7. NUMBER OF OCCUPANTS:** (In the MIC insured vehicle at the time of collision)
[0] [1] [2] [3] [4] [5] [6] [7] [8 OR MORE] [9 UNKNOWN]

**8. CLAIM HANDLING METHOD:** ☐ FIELD ADJ. INSPECTION ☐ DRIVE-IN INSPECTION ☐ OTHER _____

**9. WAS VEHICLE TOWED FROM THE SCENE?** YES / NO

**10. INJURY:** Was anyone injured in the MIC insured vehicle? (Injury may be as slight as bruises,scratches,soreness.) (Circle Only One) YES / NO / YES / NO

**11. REPORTS REQUIRED** → C.P.I.R. VEHICLE PHOTOGRAPHS 620 SURVEY 717 ESTIMATE | 620 SURVEY 717 ESTIMATE

**12. AMOUNT OF LOSS:** "Repairer's Agreed Price" for partials or "Agreed Replacement Values" less "Salvage" for totals. (Estimate Salvage if not determined) $ ☐☐☐☐ .00

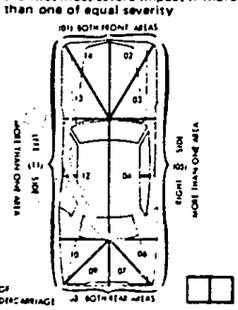
**13. IS VEHICLE A TOTAL LOSS?** [1] YES [0] NO

**14. POLICE REPORT COMPLETED:** [1] YES [0] NO

**15. ADJUSTER:** _____

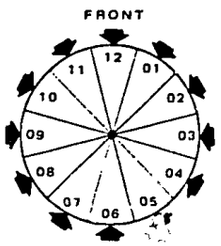
**16. DATE OF INVESTIGATION:** _____ MO. — DAY — YR.

**17. AREA OF DAMAGE:** Which area of the vehicle received the most severe damage? Choose the first most severe impact if more than one of equal severity




☐☐

**18. DIRECTION OF IMPACT:** From what direction did the other vehicle or object contact the area of major damage?




☐☐ (55) ROLLOVER

**19. NUMBER OF VEHICLES INVOLVED:** (Including the case vehicle)
[1] [2] [3] [4] [5 OR MORE] [9 UNKNOWN]

**20. OBJECT CONTACTED:** Identify the object struck which caused the major damage described in Question 17. (Enter Code Below)

| | |
|---|---|
| 01 AUTOMOBILE * | 08 FENCE |
| 02 POLE OR TREE | 09 EMBANKMENT |
| 03 DITCH | 10 BRIDGE |
| 04 GROUND (ROLLOVER ONLY) | 11 GUARDRAIL |
| 05 LIGHT TRUCK * | 12 TRAIN OR BUS |
| 06 LARGE TRUCK * | 13 CULVERT |
| 07 SIGN | 15 PEDESTRIAN |
| | 99 UNKNOWN |

14 OTHER _____ Describe ☐☐

* _____ YR. MAKE MODEL

**21. SPECIAL INFORMATION** 14 T

QUESTIONS 21 A THRU G ARE TO BE COMPLETED BY THE ADJUSTER BASED ON VEHICLE INSPECTION ONLY.

A. FUEL SYSTEM DAMAGE: ☐ YES ☐ NO ☐ UNK

FUEL SYSTEM includes: Carburetor, Fuel Lines, Fuel Filler Neck and Cap, Fuel Pump, Fuel Tank(s), Fuel Tank Straps or Attachments

B. FUEL LEAKAGE: ☐ YES ☐ NO ☐ UNK

Where _____

IF FUEL LEAKAGE OCCURRED,
1. Refer to General Memo No. 78-44 Supplement 3.
2. Call For SRDL Control Number. ☐

● IF FUEL SYSTEM was DAMAGED OR LEAKAGE occurred, COMPLETE REVERSE SIDE of this form, *INCLUDING PHOTOGRAPHS.*

**22. RESTRAINT TYPE:** ☐ MANUAL (ACTIVE) BELTS ☐ AUTOMATIC (PASSIVE) BELTS Refer to General Memo No.80 35, Sup.1

**23. RESTRAINT USAGE**

| | | |
|---|---|---|
| **DRIVER (DR)** Lap Belt Worn [YES] [NO] [UNK] [N/A]; Shldr. Belt Worn [YES] [NO] [UNK] [N/A]; SOURCE: [DR] Other:_____ | **CENTER FRONT (CF)** Lap Belt Worn [YES] [NO] [UNK] [N/A]; SOURCE: [CF] Other:_____ | **RIGHT FRONT (RF)** Lap Belt Worn [YES] [NO] [UNK] [N/A]; Shldr. Belt Worn [YES] [NO] [UNK] [N/A]; SOURCE: [RF] Other:_____ |
| **LEFT REAR (LR)** Lap Belt Worn [YES] [NO] [UNK] [N/A]; SOURCE: [LR] Other:_____ | **CENTER REAR (CR)** Lap Belt Worn [YES] [NO] [UNK] [N/A]; SOURCE: [CR] Other:_____ | **RIGHT REAR (RR)** Lap Belt Worn [YES] [NO] [UNK] [N/A]; SOURCE: [RR] Other:_____ |

COMB. 620 PRINTED IN U.S.A. MARCH 1981

Special Information (Con't.) TO BE COMPLETED ONLY IF FUEL SYSTEM WAS DAMAGED

NOTE: IF A CPIR IS NOT OTHERWISE REQUIRED FOR THIS CASE, THEN COMPLETE PAGE 2 OF CPIR AND ATTACH TO THIS FORM

**C. FUEL TANK:**

1. DAMAGE: (Check all that apply)
   ☐ NONE ☐ DEFORMED/CRUSHED ☐ CUT/PUNCTURED ☐ TORN ☐ SEAM SEPARATION

2. LEAKAGE: (Check one)
   ☐ NO ☐ YES ☐ UNKNOWN

3. DESCRIBE LEAKAGE AND/OR DAMAGE IN DETAIL:
   INDICATE EXTENT (ie: length, width, depth), SPECIFIC LOCATION, AND OBJECT OR SOURCE OF LEAKAGE AND/OR DAMAGE. _____

**D. FUEL FILLER NECK:**

1. DAMAGE: (Check all that apply)
   ☐ NONE ☐ DEFORMED/CRUSHED ☐ CUT/PUNCTURED ☐ FILLER NECK HOSE--CUT/TORN
   ☐ PARTIAL/COMPLETE SEPARATION AT SOLDER JOINT TO TANK ☐ FILLER NECK HOSE--SEPARATED FROM NECK

2. LEAKAGE: (Check one)
   ☐ NO ☐ YES ☐ UNKNOWN

3. DESCRIBE LEAKAGE AND/OR DAMAGE IN DETAIL:
   INDICATE EXTENT, SPECIFIC LOCATION, AND OBJECT OR SOURCE OF LEAKAGE AND/OR DAMAGE _____

**E. FUEL TANK SEPARATION FROM VEHICLE:** (Check one)

1. ☐ NONE ☐ PARTIAL ☐ COMPLETE

2. DESCRIBE IN DETAIL THE SPECIFIC COMPONENT, LOCATION, AND TYPE OF DAMAGE CAUSING SEPARATION _____

**F. OTHER FUEL SYSTEM DAMAGE:** (Check all that apply)

| | | | | | |
|---|---|---|---|---|---|
| 1. CARBURETOR: | ☐ NOT DAMAGED | ☐ DAMAGED | | ☐ NO LEAKAGE | ☐ LEAKAGE |
| 2. FUEL PUMP: | ☐ NOT DAMAGED | ☐ DAMAGED | | ☐ NO LEAKAGE | ☐ LEAKAGE |
| 3. FUEL LINES: | ☐ NOT DAMAGED | ☐ DAMAGED | | ☐ NO LEAKAGE | ☐ LEAKAGE |
| 4. FUEL FILLER CAP: | ☐ NOT DAMAGED | ☐ DAMAGED | ☐ MISSING | ☐ NO LEAKAGE | ☐ LEAKAGE |

5. DESCRIBE LEAKAGE AND/OR DAMAGE IN DETAIL: INDICATE EXTENT, SPECIFIC LOCATION, AND OBJECT OR SOURCE OF LEAKAGE AND/OR DAMAGE. _____

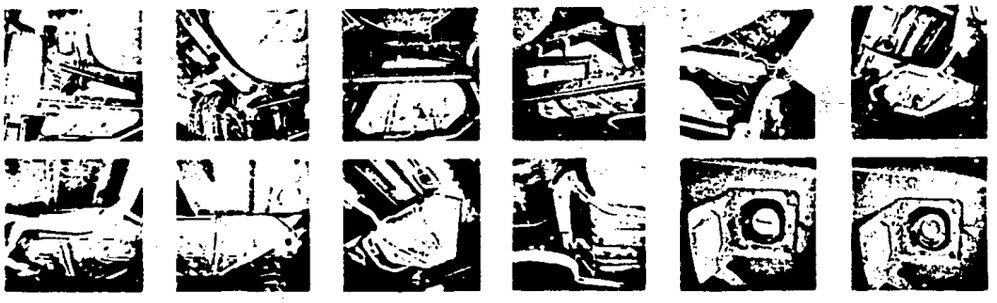
**G.**

## PHOTOGRAPHS TO BE TAKEN BY ADJUSTER

1. ALWAYS USE FLASH FOR UNDERCARRIAGE OR ENGINE COMPARTMENT PHOTOGRAPHS.

2. If a CPIR is not otherwise required, 1 roll of slide film should be used.
   - 8 exterior views, as described in the CPIR, should be taken.
   - The remaining 12 views should be used to show the fuel system damage and the surrounding area (examples below).

3. If a CPIR is required, use a second roll of film for the fuel system damage photographs (examples below).



2

**DRIVER IMPAIRMENT**

CASE DRIVER'S DRIVING PERFORMANCE IMPAIRED BY:

| | |
|---|---|
| NOTHING | LACK OF TRAINING |
| DRINKING | EMOTIONAL STATE |
| BEING DRUNK | MEDICATION |
| SLEEPING | NARCOTICS |
| FATIGUE | ILLNESS |
| RECKLESSNESS | INFIRMITIES |
| INATTENTION | PHYSICAL HANDICAP |

OTHER: _____

INFORMATION SOURCE: _____

**OTHER VEHICLE(S) DESCRIPTION**

OTHER VEHICLES INVOLVED
YES NO

DESCRIBE OTHER VEHICLES
1ST COLLISION
MAKE, MODEL, YEAR
_____
SPEED AT IMPACT _____ MPH

2ND COLLISION (IF APPLICABLE)
MAKE, MODEL, YEAR
_____
SPEED AT IMPACT _____ MPH

SPEEDS ESTIMATED BY: _____

**CASE VEHICLE DESCRIPTION**

VEHICLE IDENTIFICATION NO. _____

MAKE: _____

MODEL: _____

MODEL YEAR: _____

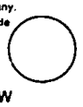
ODOMETER: _____

ESTIMATED SPEED
PRIOR TO IMPACT _____ MPH
AT IMPACT _____ MPH
ESTIMATED BY: _____

**DESCRIPTION OF COLLISION**

1. Draw heavy lines to show highway detail at the location of collision.
2. Give name of streets and highways and US, State and Interstate Route numbers, if any.
3. Identify all objects in sketch. Case vehicle should always be labeled "A". Time sequence numbers may be added (e.g., A1, A2).
4. Include dimensions when possible.

INDICATE NORTH BY ARROW



DESCRIBE COLLISION EVENTS, OBJECTS STRUCK, ETC. _____

_____

_____

_____

_____

_____

_____

_____ (CONTINUE ON PAGE 15 IF NECESSARY)

INFORMATION SOURCES: _____ REPORTED BY: _____

3

## DESCRIBE CASE VEHICLE TIRES

| TIRE POSITION | TREAD TYPE | TREAD WEAR | TIRE SIZE | TIRE CONSTRUCTION TYPE |
|---|---|---|---|---|
| L. FRONT | | | | |
| R. FRONT | | | | |
| L. REAR | | | | |
| R. REAR | | | | |
| EXAMPLES: | REGULAR<br>NON-STUDDED SNOW<br>STUDDED SNOW<br>SLICK<br>OTHER (DESCRIBE) | LIGHT<br>MEDIUM<br>HEAVY<br>BALD<br>OTHER | BR78-13<br>R195/75R-14<br>P205/70R-14<br>H78-15B<br>G70-14<br>8.75-16.5C | STEEL RADIAL<br>GLASS RADIAL<br>BIAS PLY<br>BELTED BIAS |

## CASE VEHICLE DESCRIPTION (CONT'D)

NUMBER OF OCCUPANTS:
(INCLUDE ALL OCCUPANTS IN CASE VEHICLE.) _____

ESTIMATED WEIGHT OF LUGGAGE OR CARGO _____ LBS.

TRANSMISSION
AUTOMATIC MANUAL

STEERING
POWER MANUAL

BRAKES
POWER MANUAL

TYPE OF BRAKES
ALL DRUM
FRONT DISC
ALL DISC

SUN ROOF OR REMOVEABLE ROOF PANELS
NOT EQUIPPED
OPEN CLOSED
REMOVED IN PLACE
STEEL GLASS PLASTIC
NOT RETAINED DURING COLLISION
RETAINED DURING COLLISION
NOT DAMAGED
DAMAGED, DESCRIBE: _____

TRAILER BEING TOWED
YES NO

TRAILER HITCH INSTALLED
YES NO

## FRONT END DAMAGE

HOOD LATCHES RELEASED
YES NO

HOOD LATCHES DAMAGED
YES NO

HOOD LATCHES JAMMED
YES NO

HOOD HINGES DAMAGED
NONE LEFT RIGHT

HOOD HINGES SEPARATED
NONE LEFT RIGHT

HOOD REMAINED ON VEHICLE
YES NO

HOOD CONTACTED WINDSHIELD
YES NO

HOOD TORE WINDSHIELD INTERLAYER
YES NO

FENDER CONTACTED WINDSHIELD
YES NO

ENGINE OR TRANSMISSION MOUNT SEPARATED
YES NO

STEERING COLUMN FLEXIBLE COUPLING SEPARATED
(SEE SKETCH PAGE 7)
YES NO

## FIRE

EXTENT OF FIRE
NONE MINOR MAJOR

ORIGIN OF FIRE (CIRCLE ONE)
ENGINE COMPARTMENT
PASSENGER COMPARTMENT
LUGGAGE COMPARTMENT
FUEL TANK AREA
AUXILIARY FUEL TANK
OTHER VEHICLE
OTHER _____
UNKNOWN

## LEFT SIDE — EXTERIOR (DRIVER'S SIDE)

LEFT BODY MOUNT SEPARATION
YES NO

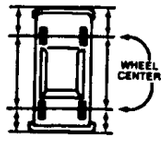
LEFT FRONT DOOR
LATCH DAMAGED
LATCH RELEASED
HINGES DAMAGED
HINGES SEPARATED
SHEET METAL DAMAGED
DOOR OPENED DURING COLLISION
DOOR JAMMED CLOSED
NOT DAMAGED

LEFT REAR DOOR
NOT EQUIPPED
LATCH DAMAGED
LATCH RELEASED
HINGES DAMAGED
HINGES SEPARATED
SHEET METAL DAMAGED
DOOR OPENED DURING COLLISION
DOOR JAMMED CLOSED
NOT DAMAGED

4

## AUTOMOBILE EXTERIOR DAMAGE

FOR ALL COLLISIONS RECORD THESE 6 DIMENSIONS.




AND ADDITIONAL DIMENSIONS TO DESCRIBE DAMAGE. (SEE EXAMPLES BELOW).

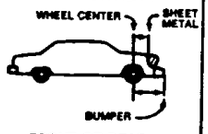
### INSTRUCTIONS:

1. SELECT APPROPRIATE VEHICLE ON PAGE 4 OR PAGE 5.
2. INDICATE CRUSHED AREAS, CAUSED BY THE COLLISION, BY OUTLINING NEW PERIMETER OF VEHICLE AND SHADING THE DAMAGED AREAS ON THE LARGE SKETCH BELOW. USE AS MANY VIEWS AS NECESSARY TO COMPLETELY DESCRIBE THE DAMAGE.
3. ENTER THE THREE DIMENSIONS TO THE CENTER OF THE WHEELS (WHEELBASE, FRONT AND REAR OVERHANGS) ON BOTH SIDES OF THE VEHICLE AS SHOWN AT LEFT.
4. ENTER THE DIMENSIONS ON THE SKETCH(ES) USING THE EXAMPLES AT THE SIDE OF THIS PAGE AS A GUIDE TO DESCRIBE THE DAMAGE. THE DIMENSIONS WHICH DESCRIBE THE AMOUNT OF CRUSH, SHOULD BE TAKEN AT THE POINT OF MAXIMUM PENETRATION.
5. ADD OTHER DIMENSIONS AS NECESSARY TO COMPLETELY DESCRIBE THE DAMAGE.
6. DESCRIBE AND LOCATE DAMAGE CAUSED BY ANYTHING OTHER THAN THE COLLISION AND NOTE CAUSE (E.G., PRE-COLLISION DAMAGE, TOWING DAMAGE, DAMAGE DUE TO REMOVAL OF OCCUPANTS, ETC.)

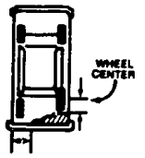
### EXAMPLES:

DO NOT WRITE IN THIS SPACE

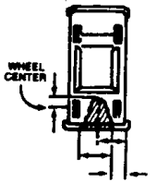
FRONT OR REAR



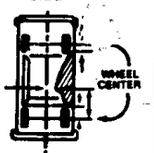

FRONT OR REAR



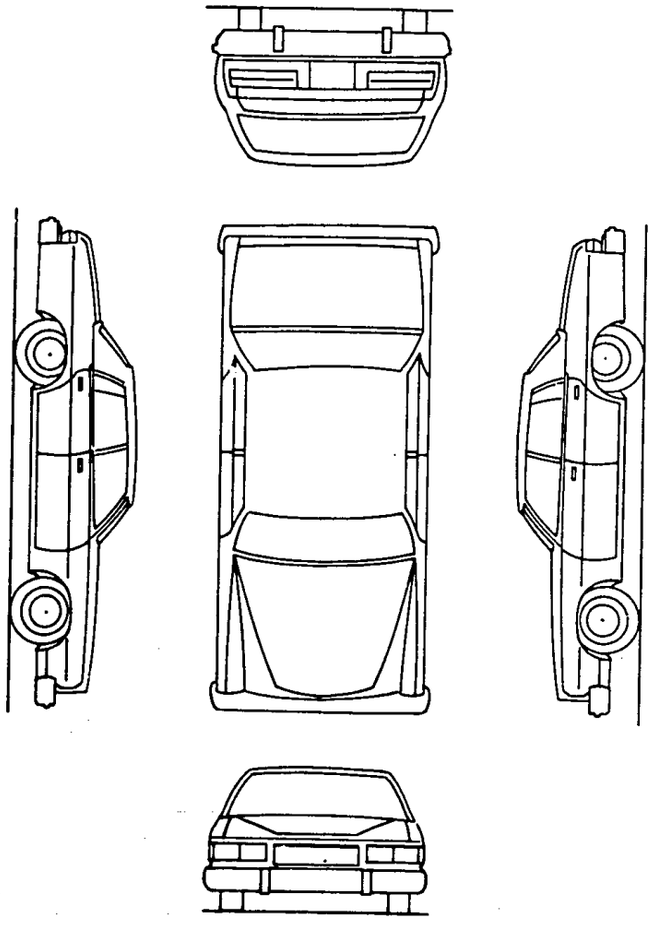

FRONT OR REAR




SIDE



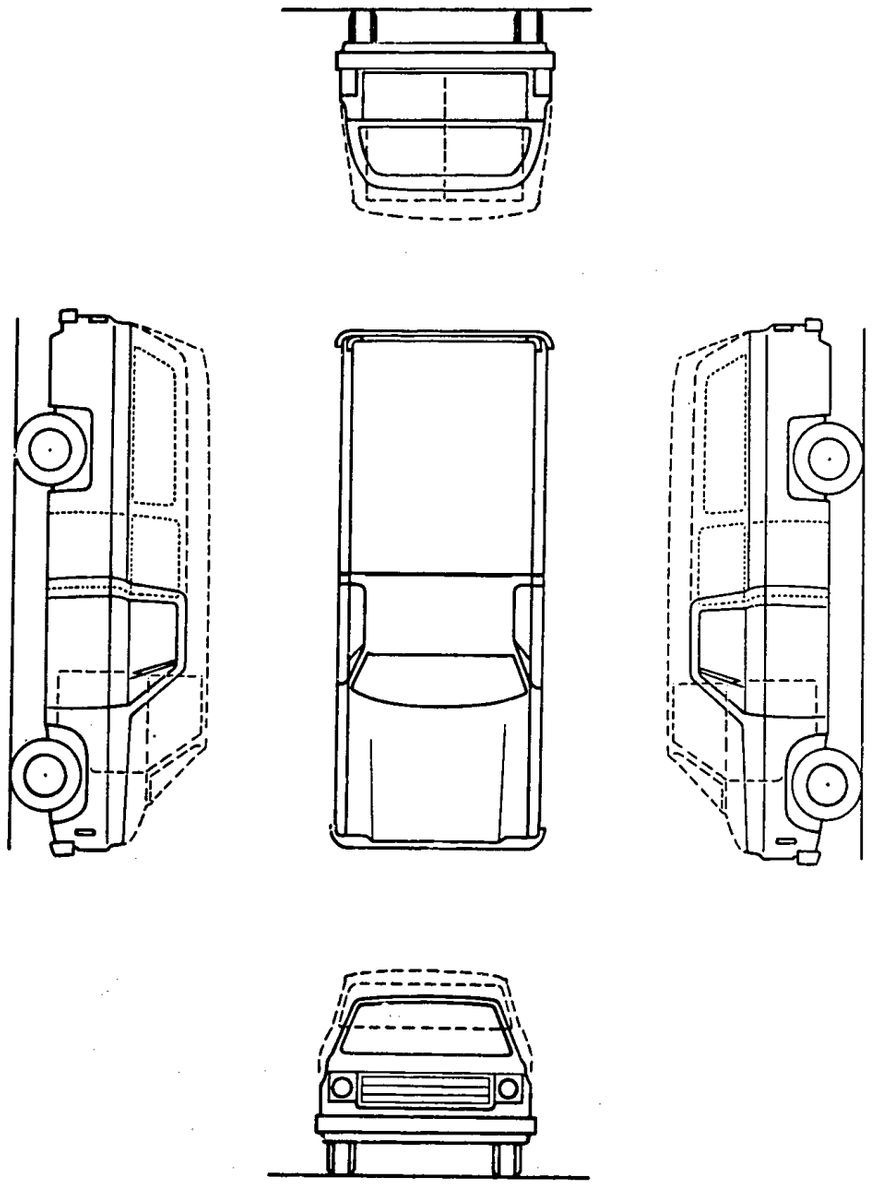

ROOF (MEASURE TO TOP OF DOOR SILL OR WINDOW SILL)

APPENDIX E

5

TRUCK AND VAN DAMAGE (See Preceding Page for Instructions and Examples)



6

## FUEL TANK AND LINES

APPROXIMATE FUEL LEVEL AT TIME OF IMPACT
- LESS THAN 1/2 FULL
- 1/2 FULL OR MORE

FUEL TANK DISENGAGED
- NO
- PARTIALLY
- COMPLETELY

TANK DEFORMED
- YES NO

FUEL FILLER NECK DEFORMED
- YES NO

FUEL LEAKAGE
- NONE MINOR MAJOR

LOCATION OF LEAKS
- NONE
- TANK
- FILLER NECK
- LINES
- OTHER: _____
- UNKNOWN

NOTE: IF TANK OR FILLER NECK DAMAGED, OR FUEL LEAKAGE OCCURRED REFER TO PAGE 15.

## TRUNK—HATCHBACK—TAILGATE

POSITION BEFORE IMPACT
- UNLATCHED LATCHED
- REMOVED

LATCHES RELEASED
- YES NO

LATCHES DAMAGED
- YES NO

LATCHES JAMMED
- YES NO

HINGES DAMAGED
- NONE
- BOTTOM LEFT
- BOTTOM RIGHT
- TOP LEFT
- TOP RIGHT

HINGES SEPARATED
- NONE
- BOTTOM LEFT
- BOTTOM RIGHT
- TOP LEFT
- TOP RIGHT

TRUNK-PASSENGER COMPARTMENT PARTITION DAMAGED
- YES NO

TAILGATE ELECTRIC WINDOW
- NOT EQUIPPED
- OPERABLE
- NOT OPERABLE

LUGGAGE AREA DAMAGED
- YES NO

SPARE TIRE SEPARATED FROM ANCHORAGE
- YES NO

## RIGHT SIDE — EXTERIOR (PASSENGER'S SIDE)

RIGHT BODY MOUNT SEPARATION
- YES NO

RIGHT FRONT DOOR
- LATCH DAMAGED
- LATCH RELEASED
- HINGES DAMAGED
- HINGES SEPARATED
- SHEET METAL DAMAGED
- DOOR OPENED DURING COLLISION
- DOOR JAMMED CLOSED
- NOT DAMAGED

RIGHT REAR DOOR
- NOT EQUIPPED
- LATCH DAMAGED
- LATCH RELEASED
- HINGES DAMAGED
- HINGES SEPARATED
- SHEET METAL DAMAGED
- DOOR OPENED DURING COLLISION
- DOOR JAMMED CLOSED
- NOT DAMAGED

## PASSENGER COMPARTMENT

PASSENGER COMPARTMENT INTERIOR, REDUCED IN SIZE
- YES NO
- WHERE? _____

INTRUSION BY AN EXTERNAL OBJECT
- YES NO
- DESCRIBE _____

LOOSE OBJECTS INSIDE PASSENGER COMPARTMENT
- YES NO
- DESCRIBE _____

COWL DEFORMED
- YES NO

FLOORPAN (INCLUDING TOEPAN) DEFORMED
- YES NO

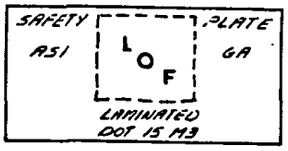
WINDSHIELD
- NOT DAMAGED
- CRACKED
- BROKEN (TORN INTERLAYER)
- OCCUPANT CONTACT
- CRACKED OR BROKEN BY OCCUPANT CONTACT

WINDSHIELD PERIMETER SEPARATED FROM VEHICLE
- YES NO
- APPROX. PERCENT OF PERIMETER SEPARATION _____

WINDSHIELD MARK

DRAW GLASS MANUFACTURER'S WINDSHIELD MARK (LOCATED AT BOTTOM OF WINDSHIELD AT CENTER OR CORNER.)

EXAMPLE:




VEHICLE WINDSHIELD MARK

7

## STEERING WHEEL

**STEERING WHEEL DAMAGE**

NONE
SLIGHTLY DEFORMED
SEVERELY BENT
BROKEN

**HORN BUTTONS OR SPOKE SHROUD DAMAGE**

YES NO

**OCCUPANT CONTACT WITH STEERING WHEEL**

NONE
RIM
SPOKES
HORN ACTUATOR
SPOKE SHROUD

**COLUMN TYPE**

STANDARD
TILT ONLY
TILT AND TELESCOPE

**TILT MECHANISM DAMAGED**

YES NO
NOT EQUIPPED

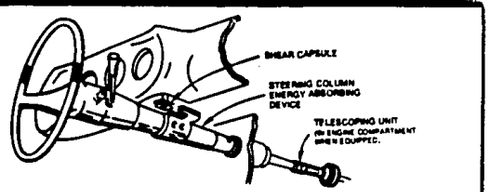
DESCRIBE DAMAGE: _____

## STEERING COLUMN MEASUREMENTS

**SOUND INSULATING PANELS MUST BE REMOVED TO MEASURE SHEAR CAPSULES AND ENERGY ABSORBING DEVICE.**

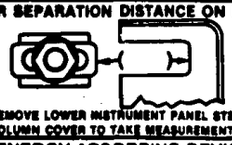
**SOME VEHICLES ALSO REQUIRE REMOVAL OF PANEL AND/OR AIR DUCT BELOW STEERING COLUMN.**

**THESE MEASUREMENTS SHOULD BE TAKEN EVEN WHEN COLUMN APPEARS UNDAMAGED.**




### SHEAR CAPSULE SEPARATION

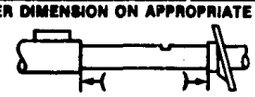
**ENTER SEPARATION DISTANCE ON DIAGRAM**



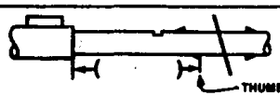

REMOVE LOWER INSTRUMENT PANEL STEERING COLUMN COVER TO TAKE MEASUREMENT

### ENERGY ABSORBING DEVICE

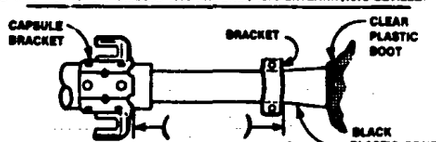
**ENTER DIMENSION ON APPROPRIATE DIAGRAM**



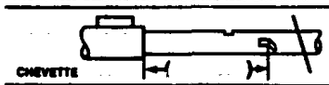

ALL GM PASSENGER CARS EXCEPT THOSE LISTED BELOW

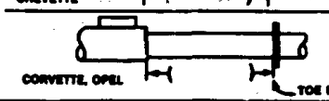



LIGHT TRUCKS, CAMARO, FIREBIRD, MONZA, SUNBIRD, SKYHAWK, STARFIRE, AND 1979 NOVA, 1979 OMEGA, 1979 PHOENIX, 1979 SKYLARK ,1979 SEVILLE.




1980 CITATION, 1980 OMEGA, 1980 PHOENIX, 1980 SKYLARK.



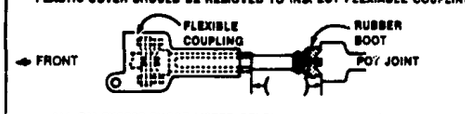




**NOT EQUIPPED: VANS**

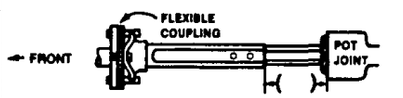
### ENGINE COMPARTMENT TELESCOPING UNIT

**ENTER TELESCOPED LENGTH ON APPROPRIATE DIAGRAM**

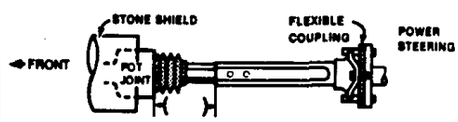
PLASTIC COVER SHOULD BE REMOVED TO INSPECT FLEXIABLE COUPLING

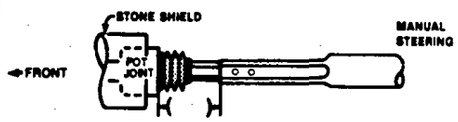



ALL GM EXCEPT THOSE LISTED BELOW




LIGHT TRUCKS AND 1979 NOVA, 1979 OMEGA, 1979 PHOENIX, 1979 SKYLARK




MONZA-SKYHAWK-SUNBIRD-STARFIRE

**NOT EQUIPPED: VANS, CHEVETTE, CORVETTE, OPEL, AND 1980 CITATION, 1980 OMEGA, 1980 PHOENIX, 1980 SKYLARK**

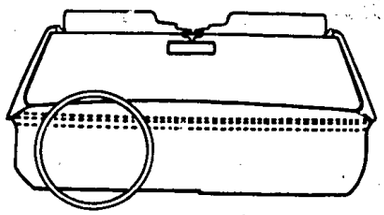
8

## INSTRUMENT PANEL

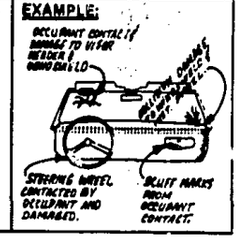
SKETCH ON DIAGRAM ALL OCCUPANT CONTACT MARKS AND/OR DAMAGE

DISTINGUISH BETWEEN DAMAGE AND OCCUPANT CONTACT MARKS.

(IT WILL BE HELPFUL TO SKETCH MAJOR COMPONENTS SUCH AS GLOVE BOX, RADIO, ETC., IN ORDER TO LOCATE CONTACT AREAS.)



EXAMPLE:




## OTHER INTERIOR ITEMS

**ASHTRAY**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**CONTROL KNOBS AND LEVERS**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**GLOVE COMPARTMENT AREA**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**INSTRUMENTS**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**PARKING BRAKE**
NOT EQUIPPED NOT DAMAGED
DAMAGED OCCUPANT CONTACT

**A/C OR UPPER VENTILATION OUTLETS**
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**HEATER OR A/C DUCTS (LOWER)**
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**RADIO (IN DASH INSTALLATION)**
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**CB RADIO OR TAPE PLAYER**
(INSTALLED BELOW DASH OR ON TUNNEL)
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**FOOT CONTROLS**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**IGNITION KEY**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**REAR VIEW MIRROR**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**SUNVISOR AND FITTINGS**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**WINDSHIELD TOP MOULDING**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

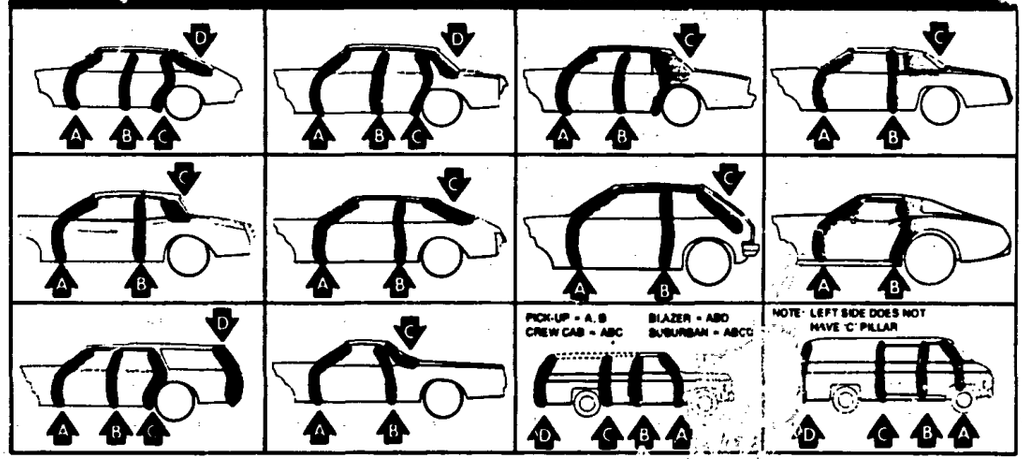
**LEFT A-PILLAR (SEE BELOW)**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**RIGHT A-PILLAR**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**CENTER CONSOLE**
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**TRANSMISSION SELECTOR LEVER**
ON COLUMN ON FLOOR
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

## PILLAR DEFINITIONS

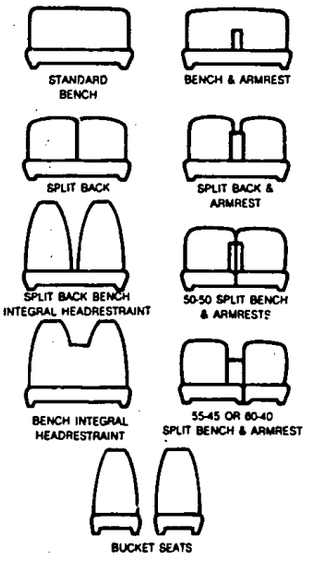


9

## FRONT SEAT DESCRIPTION

### TYPE OF FRONT SEAT

CIRCLE SKETCH BELOW WHICH BEST REPRESENTS FRONT SEAT.




### CENTER ARMREST (FRONT SEAT)

NOT DAMAGED DAMAGED

NOT EQUIPPED

### CENTER ARMREST POSITION PRIOR TO COLLISION

UP DOWN

## DRIVER SEAT

### TYPE OF SEAT ADJUSTERS

MANUAL

POWER

RIGID

### TYPE OF SEAT ADJUSTMENT

2-WAY

6-WAY

SWIVEL

OTHER:_____

### ADJUSTER DAMAGE

NONE

DEFORMED

CHUCKING

JAMMED

SEPARATED AT FLOOR

SEPARATED IN ADJUSTER

SEPARATED AT SEAT

UNKNOWN

### POSITION OF DRIVER'S SEAT (PRIOR TO COLLISION)

FORWARD MIDDLE

REARWARD

### SEAT DAMAGE

NONE

BACKREST CUSHION

### RECLINING SEAT BACK POSITION

NOT EQUIPPED

UP (NOT RECLINED)

MIDDLE

DOWN (FULLY RECLINED)

### SEAT BACK CONTACTED BY REAR SEAT OCCUPANT

YES NO

### HEAD RESTRAINT (DRIVER)

ADJUSTABLE INTEGRAL

NOT EQUIPPED NOT DAMAGED

DAMAGED OCCUPANT CONTACT

RETAINED DURING COLLISION

REMOVED PRIOR TO COLLISION

### ADJUSTABLE HEAD RESTRAINT POSITION AT TIME OF COLLISION

UP DOWN REMOVED

## R. FRONT PASSENGER SEAT

### TYPE OF SEAT ADJUSTERS

MANUAL

POWER

RIGID

### TYPE OF SEAT ADJUSTMENT

2-WAY

6-WAY

SWIVEL

OTHER:_____

### ADJUSTER DAMAGE

NONE

DEFORMED

CHUCKING

JAMMED

SEPARATED AT FLOOR

SEPARATED IN ADJUSTER

SEPARATED AT SEAT

UNKNOWN

### POSITION OF PASSENGER'S SEAT (PRIOR TO COLLISION)

FORWARD MIDDLE

REARWARD

### SEAT DAMAGE

NONE

BACKREST CUSHION

### RECLINING SEAT BACK POSITION

NOT EQUIPPED

UP (NOT RECLINED)

MIDDLE

DOWN (FULLY RECLINED)

### SEAT BACK CONTACTED BY REAR SEAT OCCUPANT

YES NO

### HEAD RESTRAINT (FRONT PASS.)

ADJUSTABLE INTEGRAL

NOT EQUIPPED NOT DAMAGED

DAMAGED OCCUPANT CONTACT

RETAINED DURING COLLISION

REMOVED PRIOR TO COLLISION

### ADJUSTABLE HEAD RESTRAINT POSITION AT TIME OF COLLISION

UP DOWN REMOVED

## REAR SEAT DESCRIPTION

### TYPE OF REAR SEAT

NO SEAT

NON-FOLDING FOLDING

### REAR SEAT DAMAGE

BACKREST

LOOSENED FOLDED DOWN

NOT DAMAGED DAMAGED

CUSHION

LOOSENED

NOT DAMAGED DAMAGED

### CENTER ARMREST (REAR SEAT)

NOT EQUIPPED

NOT DAMAGED DAMAGED

### CENTER ARMREST POSITION (PRIOR TO COLLISION)

UP DOWN

### SEAT BACK LOCKS (REAR SEAT)

LEFT

NOT EQUIPPED

HELD RELEASED

RIGHT

NOT EQUIPPED

HELD RELEASED

## THIRD SEAT

NOT EQUIPPED

NOT DAMAGED

BACKREST DAMAGED

CUSHION DAMAGED

FOLDED DOWN

10

## GLASS

**BACKLIGHT (REAR WINDOW)**
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**BACKLIGHT HEADER**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**WINDOWS CLOSED AT TIME OF COLLISION**
LEFT FRONT
YES NO
LEFT REAR
YES NO
RIGHT FRONT
YES NO
RIGHT REAR
YES NO

**SIDE WINDOWS**
MANUAL ALL OPERABLE
POWER ONE OR MORE NOT OPERABLE

## LEFT SIDE INTERIOR

**FRONT DOOR**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
HARDWARE (FRONT DOOR)
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
ARMREST (FRONT DOOR)
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
WINDOW (FRONT DOOR)
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**REAR DOOR AREA**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
HARDWARE (REAR DOOR AREA)
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
ARMREST (REAR DOOR AREA)
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
WINDOW (REAR DOOR AREA)
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**ROOF SIDE RAIL**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**PILLARS (SEE DEFINITIONS PAGE 8)**
B PILLAR
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
C PILLAR
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
D PILLAR
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

## RIGHT SIDE INTERIOR

**FRONT DOOR**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
HARDWARE (FRONT DOOR)
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
ARMREST (FRONT DOOR)
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
WINDOW (FRONT DOOR)
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**REAR DOOR AREA**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
HARDWARE (REAR DOOR AREA)
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
ARMREST (REAR DOOR AREA)
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
WINDOW (REAR DOOR AREA)
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**ROOF SIDE RAIL**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**PILLARS (SEE DEFINITIONS PAGE 8)**
B PILLAR
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
C PILLAR
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT
D PILLAR
NOT EQUIPPED
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

## ROOF INTERIOR

**HEADLINING**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

**ROOF STRUCTURE**
NOT DAMAGED DAMAGED
OCCUPANT CONTACT

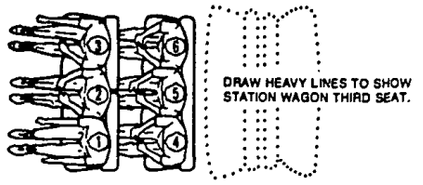
11

## OCCUPANT LOCATIONS

**CIRCLE NUMBERS TO INDICATE ORIGINAL POSITIONS OF ALL OCCUPANTS.**

ADD ADDITIONAL NUMBERS TO INDICATE REPORTED OCCUPANT POSITIONS OTHER THAN THOSE SHOWN ON THE DIAGRAM.

NOTE: USE OCCUPANT LOCATION NUMBERS FROM DIAGRAM IN COMPLETING PAGES 12, 13 AND 14




DRAW HEAVY LINES TO SHOW STATION WAGON THIRD SEAT.

## EXPLANATION OF TERMS ON PAGES 12, 13, 14

**OCCUPANT DESCRIPTION:** ALL OCCUPANT RELATED INFORMATION (AGE, SEX, HEIGHT, WEIGHT, RESTRAINT USAGE, EXIT FROM VEHICLE, ETC.) IS EXTREMELY IMPORTANT REGARDLESS OF INJURY. INTERVIEW EACH OCCUPANT DIRECTLY IF POSSIBLE.

**EJECTION:** THIS MEANS THAT SOME PART OF THE OCCUPANT OR THE WHOLE OCCUPANT WAS THROWN THROUGH AN OPENING IN THE VEHICLE AT SOME TIME DURING THE COLLISION.

**OCCUPANT EXIT FROM VEHICLE:** HOW DID THE OCCUPANT EXIT THE VEHICLE AFTER THE COLLISION? IF THE OCCUPANT WAS ASSISTED FROM THE VEHICLE, DESCRIBE WHY AND HOW ON PAGE 15.

**OCCUPANT INJURED:** THE MOST MINOR INJURIES SUCH AS SORENESS, BRUISES OR COMPLAINT OF PAIN, ARE CONSIDERED INJURY LEVELS FOR THE PURPOSES OF THIS STUDY, AND ARE AS IMPORTANT AS THE MORE SEVERE INJURIES.

**OCCUPANT UNCONSCIOUS:** IF THE OCCUPANT WAS UNCONSCIOUS, INDICATE THE LENGTH OF TIME.

**TREATMENT:**
- IF MORE THAN ONE TYPE OF TREATMENT WAS GIVEN, INDICATE THE MOST EXTENSIVE TYPE.
- "HOSPITALIZED (OBSERVATION LESS THAN 24 HRS.)" MEANS ADMITTANCE FOR LESS THAN 24 HOURS WITH NO SIGNIFICANT TREATMENT INVOLVED.
- IF THE OCCUPANT WAS FATALLY INJURED, PLEASE FORWARD DEATH CERTIFICATE AND POLICE REPORT, ALSO AN AUTOPSY REPORT IF POSSIBLE.

**RESTRAINTS:** PLACE AN X IN THE APPROPRIATE BOX ON EACH OCCUPANT PAGE.

NOTE: PASSIVE (AUTOMATIC) BELT RESTRAINT SYSTEMS MAY BE INSTALLED IN SOME VEHICLES IN THE OUTBOARD FRONT SEAT POSITION ONLY. A VEHICLE EQUIPPED WITH A PASSIVE SHOULDER BELT SYSTEM MAY HAVE AN ACTIVE TYPE LAP BELT.

LAP BELT TYPE:

PASSIVE — LAP BELT ANCHOR ATTACHED TO FRONT DOOR.

ACTIVE — LAP BELT ANCHOR NOT ATTACHED TO FRONT DOOR.

SHOULDER BELT TYPE:

PASSIVE — SHOULDER BELT ANCHOR ATTACHED TO UPPER FRONT DOOR FRAME.

ACTIVE — SHOULDER BELT ANCHOR NOT ATTACHED TO UPPER FRONT DOOR FRAME.

**INJURY INFORMATION AND POSSIBLE CONTACT AREAS:** PLEASE BE AS SPECIFIC AS POSSIBLE ON THE FOLLOWING ITEMS:

A. NAME EACH BODY PART THAT WAS INJURED AND LOCATE IT ON THE DRAWING: E.G. TOP OF HEAD, UPPER ARM, THORACIC VERTEBRAE (MIDDLE SPINE), THIGH, ETC.

B. WRITE THE NATURE OF EACH INJURY NEXT TO THE BODY PART (E.G. SORENESS, BRUISE, LACERATION, ABRASION, FRACTURE, BURN, CONCUSSION, COMPLAINT OF PAIN, ETC.)

C. WRITE THE DEGREE OF EACH INJURY (E.G., MAJOR, SLIGHT, 1-IN., COMPOUND, ETC.)

D. NOTE ANY SPECIFIC TREATMENT SUCH AS: NUMBER OF STITCHES TO CLOSE A LACERATION, SURGERY ASSOCIATED WITH A FRACTURE OR INTERNAL BLEEDING, ETC.

E. NUMBER EACH INJURY ON THE DRAWING IN A SEQUENTIAL ORDER AND PLACE THE INJURY NUMBERS IN THE TABLE AT THE BOTTOM OF THE OCCUPANT PAGE.

F. IF YOU ARE REASONABLY ASSURED THAT ONE OR MORE SPECIFIC VEHICLE COMPONENTS OR AREAS CONTACTED BY THE OCCUPANT RESULTED IN AN ASSOCIABLE INJURY, THEN ENTER THIS INFORMATION IN THE TABLE AT THE BOTTOM OF THE OCCUPANT PAGE FOLLOWING THE APPROPRIATE INJURY NUMBER. ENTER THE INFORMATION SHOWING THE MOST LIKELY AREA FIRST; THE NEXT MOST LIKELY, SECOND; ETC.

12

**THIS SECTION SHOULD BE FILLED IN WHETHER OCCUPANT WAS INJURED OR NOT**
Refer to Page 11 for Explanation of Terms Used

OCCUPANT LOCATION NO. _____

POSTURE AT MOMENT OF IMPACT

- SITTING ON SEAT
- STANDING ON SEAT
- LYING ON SEAT
- ON CENTER ARMREST
- ON CONSOLE
- SITTING ON FLOOR
- STANDING ON FLOOR
- LYING ON FLOOR
- ON LAP
- IN ARMS
- IN BASSINET
- IN CHILD SEAT
- ON FOLDED SEAT
- EXTERNAL TO PASS. COMP.

MALE FEMALE

AGE _____ YEARS OR

_____ MONTHS (INFANT)

WEIGHT _____ LBS.

HEIGHT _____ FT. _____ IN.

OCCUPANT EJECTED

NO PARTIALLY COMPLETELY

IF EJECTED, THROUGH WHAT?

_____

OCCUPANT EXIT FROM VEHICLE (NOT EJECTION)

- LEFT FRONT DOOR
- RIGHT FRONT DOOR
- LEFT REAR DOOR
- RIGHT REAR DOOR
- OTHER _____

DID OCCUPANT REQUIRE ASSISTANCE TO EXIT THE VEH.? YES NO
IF YES, DESCRIBE ON PAGE 15.

OCCUPANT INJURED

YES NO

OCCUPANT UNCONSCIOUS

YES NO

HOW LONG? _____

TREATMENT

- NONE
- FIRST AID AT SCENE
- EXAMINED OR FIRST AID GIVEN AT HOSPITAL CLINIC OR BY DOCTOR BUT NOT ADMITTED (____HR)
- HOSPITALIZED (OBSERVATION LESS THAN 24 HR) (____HR)
- HOSPITALIZED FOR SIGNIFICANT TREATMENT (____DAYS)
- FATAL
- UNKNOWN

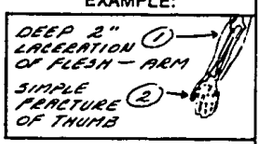
RESTRAINT SYSTEM

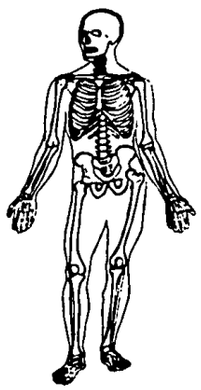
| | LAP BELT | SHOULDER BELT |
|---|---|---|
| TYPE | ☐ ACTIVE ☐ PASSIVE | ☐ ACTIVE ☐ PASSIVE ☐ NONE |
| WORN | ☐ YES<br>☐ NO<br>☐ UNKNOWN | ☐ NOT WORN<br>☐ WORN-OVER SHOULDER, ACROSS CHEST<br>☐ WORN-UNDER ARM, ACROSS CHEST<br>☐ CONNECTED BEHIND BACK<br>☐ OTHER _____ |

CHILD RESTRAINT: MAKE _____ MODEL NO. _____
(IF USED) PUT GENERAL COMMENTS ABOUT RESTRAINTS ON PAGE 15.

PINPOINT AND DESCRIBE IN DETAIL, ALL INJURIES NO MATTER HOW MINOR.

EXAMPLE:



WHO WAS SOURCE OF INFORMATION? _____

| INJURY NO. | POSSIBLE CONTACT AREA(S) ASSOCIATED WITH THIS INJURY (MOST LIKELY FIRST) | | |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

NOTE: IF NO MORE OCCUPANTS, CIRCLE THE WORD "NOTE" AND SKIP TO BACK COVER.

13

**THIS SECTION SHOULD BE FILLED IN WHETHER OCCUPANT WAS INJURED OR NOT**
Refer to Page 11 for Explanation of Terms Used

OCCUPANT LOCATION NO. _____

POSTURE AT MOMENT OF IMPACT

- SITTING ON SEAT
- STANDING ON SEAT
- LYING ON SEAT
- ON CENTER ARMREST
- ON CONSOLE
- SITTING ON FLOOR
- STANDING ON FLOOR
- LYING ON FLOOR
- ON LAP
- IN ARMS
- IN BASSINET
- IN CHILD SEAT
- ON FOLDED SEAT
- EXTERNAL TO PASS. COMP.

MALE FEMALE

AGE _____ YEARS OR

_____ MONTHS (INFANT)

WEIGHT _____ LBS.

HEIGHT _____ FT. _____ IN.

OCCUPANT EJECTED

NO PARTIALLY COMPLETELY

IF EJECTED, THROUGH WHAT?

_____

OCCUPANT EXIT FROM VEHICLE (NOT EJECTION)

- LEFT FRONT DOOR
- RIGHT FRONT DOOR
- LEFT REAR DOOR
- RIGHT REAR DOOR
- OTHER _____

DID OCCUPANT REQUIRE ASSISTANCE TO EXIT THE VEH.? YES NO
IF YES, DESCRIBE ON PAGE 15.

OCCUPANT INJURED

YES NO

OCCUPANT UNCONSCIOUS

YES NO

HOW LONG? _____

TREATMENT

- NONE
- FIRST AID AT SCENE
- EXAMINED OR FIRST AID GIVEN AT HOSPITAL CLINIC OR BY DOCTOR BUT NOT ADMITTED (____ HR)
- HOSPITALIZED (OBSERVATION LESS THAN 24 HR) (____ HR)
- HOSPITALIZED FOR SIGNIFICANT TREATMENT (____ DAYS)
- FATAL
- UNKNOWN

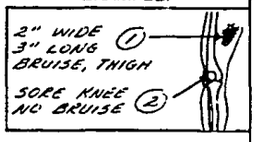
RESTRAINT SYSTEM

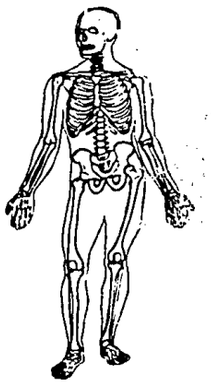
| | LAP BELT | SHOULDER BELT |
|---|---|---|
| TYPE | ☐ ACTIVE ☐ PASSIVE | ☐ ACTIVE ☐ PASSIVE ☐ NONE |
| WORN | ☐ YES<br>☐ NO<br>☐ UNKNOWN | ☐ NOT WORN<br>☐ WORN-OVER SHOULDER, ACROSS CHEST<br>☐ WORN-UNDER ARM, ACROSS CHEST<br>☐ CONNECTED BEHIND BACK<br>☐ OTHER _____ |

CHILD RESTRAINT: MAKE _____ MODEL NO. _____
(IF USED) PUT GENERAL COMMENTS ABOUT RESTRAINTS ON PAGE 15

PINPOINT AND DESCRIBE IN DETAIL, ALL INJURIES NO MATTER HOW MINOR.

EXAMPLE:



WHO WAS SOURCE OF INFORMATION? _____

| INJURY NO. | POSSIBLE CONTACT AREA(S) ASSOCIATED WITH THIS INJURY (MOST LIKELY FIRST) | | |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

NOTE: IF NO MORE OCCUPANTS, CIRCLE THE WORD "NOTE" AND SKIP TO BACK COVER.

14

**THIS SECTION SHOULD BE FILLED IN WHETHER OCCUPANT WAS INJURED OR NOT**
Refer to Page 11 for Explanation of Terms Used

OCCUPANT LOCATION NO. _____

POSTURE AT MOMENT OF IMPACT

SITTING ON SEAT
STANDING ON SEAT
LYING ON SEAT
ON CENTER ARMREST
ON CONSOLE
SITTING ON FLOOR
STANDING ON FLOOR
LYING ON FLOOR
ON LAP
IN ARMS
IN BASSINET
IN CHILD SEAT
ON FOLDED SEAT
EXTERNAL TO PASS. COMP.

MALE FEMALE

AGE _____ YEARS OR

_____ MONTHS (INFANT)

WEIGHT _____ LBS.

HEIGHT _____ FT. _____ IN.

OCCUPANT EJECTED

NO PARTIALLY COMPLETELY

IF EJECTED, THROUGH WHAT?

_____

OCCUPANT EXIT FROM VEHICLE (NOT EJECTION)

LEFT FRONT DOOR
RIGHT FRONT DOOR
LEFT REAR DOOR
RIGHT REAR DOOR
OTHER _____

DID OCCUPANT REQUIRE ASSISTANCE TO EXIT THE VEH.? YES NO
IF YES, DESCRIBE ON PAGE 15.

OCCUPANT INJURED

YES NO

OCCUPANT UNCONSCIOUS

YES NO

HOW LONG? _____

TREATMENT

NONE
FIRST AID AT SCENE
EXAMINED OR FIRST AID GIVEN AT HOSPITAL CLINIC OR BY DOCTOR BUT NOT ADMITTED (____ HR)
HOSPITALIZED (OBSERVATION LESS THAN 24 HR) (____ HR)
HOSPITALIZED FOR SIGNIFICANT TREATMENT (____ DAYS)
FATAL
UNKNOWN

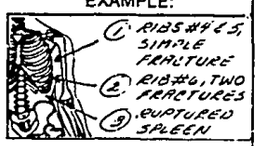
RESTRAINT SYSTEM

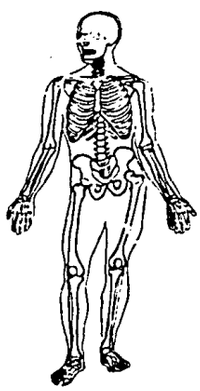
| | LAP BELT | SHOULDER BELT |
|---|---|---|
| TYPE | ☐ ACTIVE ☐ PASSIVE | ☐ ACTIVE ☐ PASSIVE ☐ NONE |
| WORN | ☐ YES<br>☐ NO<br>☐ UNKNOWN | ☐ NOT WORN<br>☐ WORN-OVER SHOULDER, ACROSS CHEST<br>☐ WORN-UNDER ARM, ACROSS CHEST<br>☐ CONNECTED BEHIND BACK<br>☐ OTHER _____ |

CHILD RESTRAINT: MAKE _____ MODEL NO. _____
(IF USED) PUT GENERAL COMMENTS ABOUT RESTRAINTS ON PAGE 15

PINPOINT AND DESCRIBE IN DETAIL, ALL INJURIES NO MATTER HOW MINOR.

EXAMPLE:



WHO WAS SOURCE OF INFORMATION? _____

| INJURY NO. | POSSIBLE CONTACT AREA(S) ASSOCIATED WITH THIS INJURY (MOST LIKELY FIRST) | | |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

NOTE: IF THERE WERE MORE THAN 3 OCCUPANTS, USE ADDITIONAL COPIES OF THIS PAGE AND ATTACH TO THIS REPORT.

# APPENDIX E

## GM "COLLISION PERFORMANCE AND INJURY REPORT"

ENGINEERING STAFF

SRDL-119 82 REV. 8/78

# COLLISION PERFORMANCE AND INJURY REPORT
## FIELD FORM (6TH EDITION)

NOTE: CIRCLE ALL THE CORRECT ANSWERS AND FILL IN THE BLANKS. REFER TO ADJUSTER'S CP & IR MANUAL FOR DETAILED INSTRUCTIONS.

DATE OF COLLISION

TIME OF COLLISION
☐ AM
____ : ____ ☐ PM

DATE OF VEHICLE INVESTIGATION

INVESTIGATOR (VEHICLE INSPECTION)

LOCATION OF VEHICLE WHEN INVESTIGATED

BRANCH OFFICE

INVESTIGATOR ( OCCUPANT & ACC INFORMATION )

POLICY NUMBER

PERSON INSURED

CASE VEHICLE REPAIR COST OR REPLACEMENT COST LESS SALVAGE $ _____

### DESCRIBE COLLISION SCENE AND WEATHER AT TIME OF COLLISION

STATE: _____

CITY (OR TOWNSHIP): _____

_____

AREA
URBAN RURAL

LOCALITY
MANUFACTURING OR INDUSTRIAL
SHOPPING OR BUSINESS
APARTMENTS
SCHOOL OR PLAYGROUND
RESIDENTIAL
FARM
UNDEVELOPED
OTHER: _____

LIMITED ACCESS HIGHWAY
YES NO

DIVIDED HIGHWAY
YES NO

TOTAL NO. OF LANES
(INCLUDE BOTH DIRECTIONS AND PARKING LANES)
CASE VEHICLE ROAD _____
CROSS ROAD _____

ROAD TYPE
ASPHALT GRAVEL
CONCRETE
OTHER: _____

ROAD ALIGNMENT
VERTICAL
LEVEL TOP OF HILL
SLOPE BOTTOM OF HILL
OTHER: _____
HORIZONTAL
STRAIGHT CURVE
OTHER: _____

ROAD COVERING
DRY
WATER
DAMP WET
PUDDLED
OTHER: _____
SNOW
LOOSE PACKED
OTHER: _____
ICE
SLUSH
GRAVEL
OTHER: _____

PRECIPITATION
NONE HAIL
RAIN SLEET
SNOW
OTHER: _____

RATE OF PRECIPITATION
NONE LIGHT
MODERATE HEAVY

SURFACE SLIPPERY
YES NO

SPEED LIMIT _____ MPH

SURFACE DEFECTS
NONE BUMPS
CHUCK HOLES
OTHER: _____

CROSSWIND
NONE STRONG
LIGHT STRONG & GUSTY

TIME OF DAY
DAY DUSK
NIGHT DAWN

VISIBILITY LIMITATION
NONE CLOUDY-DARK
FOG SMOKE
GLARE
WINDSHIELD CONDITION
OTHER: _____

VISIBILITY OBSTRUCTION
NONE TREE(S)
BUILDING HILL
SIGN CURVE IN ROAD
BUSHES
OTHER: _____

APPENDIX E

15

## FUEL TANK DAMAGE OR FUEL LEAKAGE

1. DESCRIBE IN DETAIL, THE SPECIFIC LOCATION AND EXTENT OF DAMAGE TO THE FUEL TANK OR LINES.
2. PHOTOGRAPH THE TANK AND SURROUNDING UNDERCARRIAGE AREA. TAKE AT LEAST FOUR PHOTOS, WHICH MAY REQUIRE A SECOND ROLL OF FILM. TO PROPERLY PHOTOGRAPH THIS AREA, IT WILL BE NECESSARY TO HAVE THE VEHICLE RAISED BY WRECKER OR HOIST ETC. ALWAYS USE FLASH FOR THIS TYPE OF PHOTOGRAPHY.

*U.S. GOVERNMENT PRINTING OFFICE: 1981-0-341-828/65

END

DATE

FILMED

12-1-81

NTIS